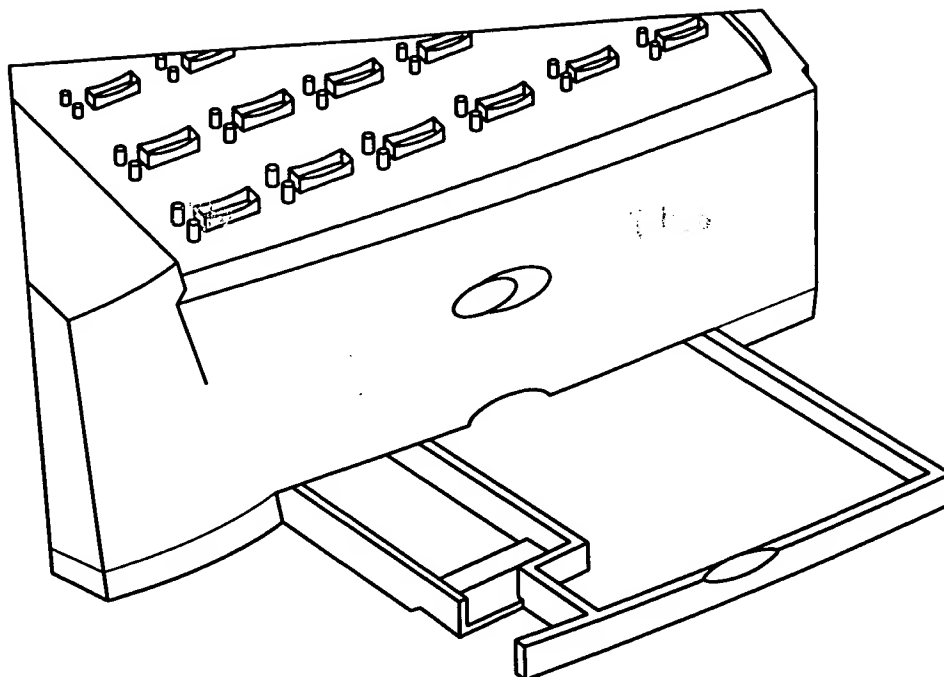
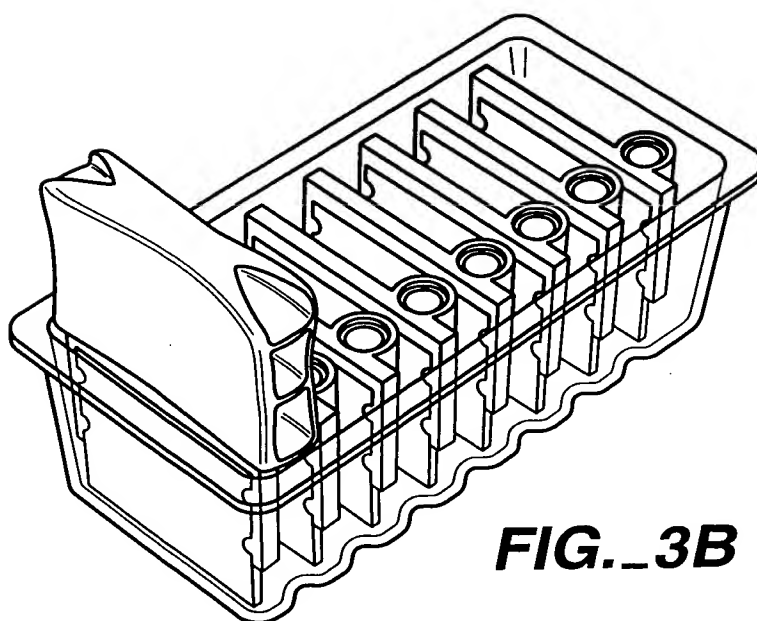


**FIG. 2**

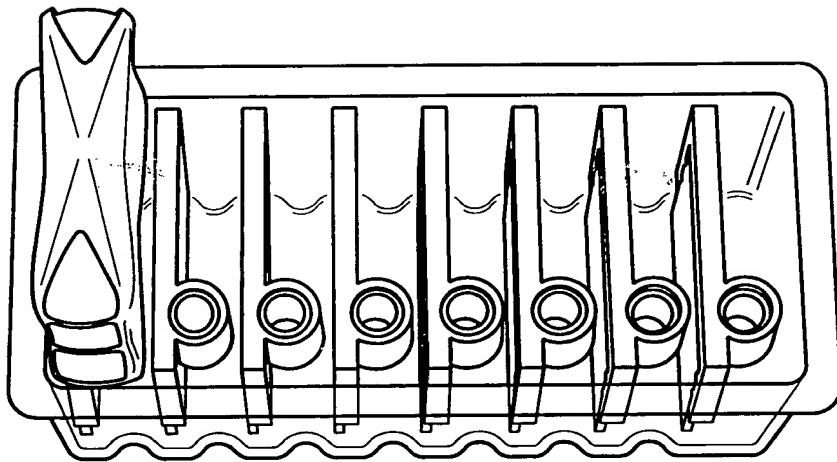




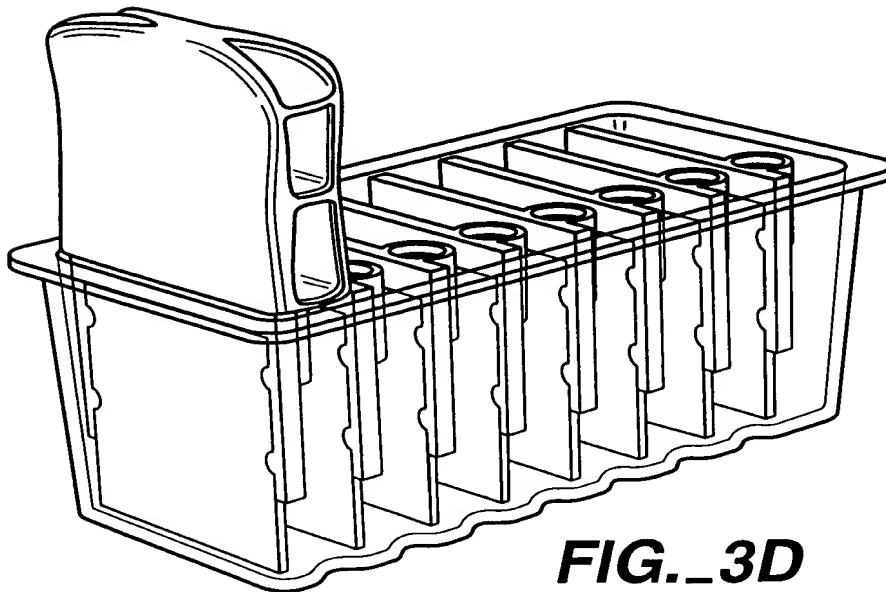
**FIG. 3A**



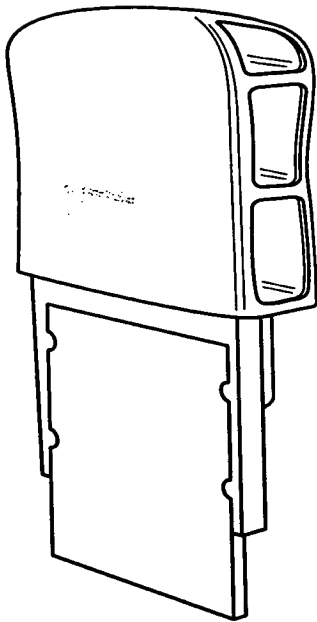
**FIG. 3B**



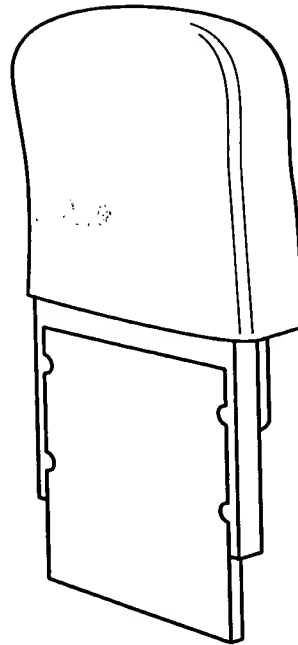
**FIG.\_3C**



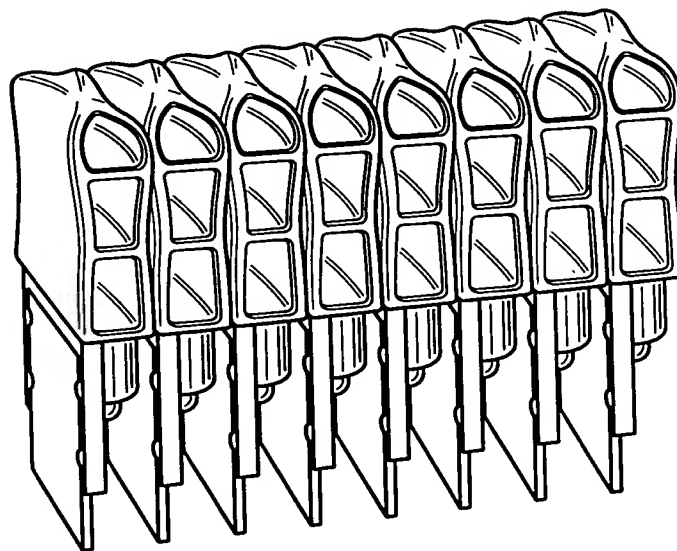
**FIG.\_3D**



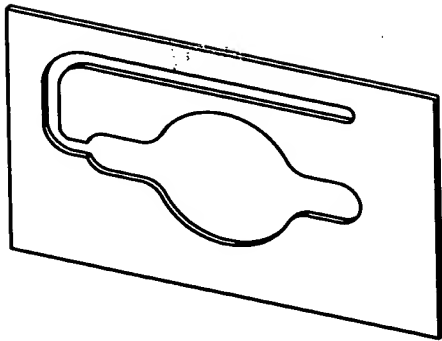
**FIG. 3E**



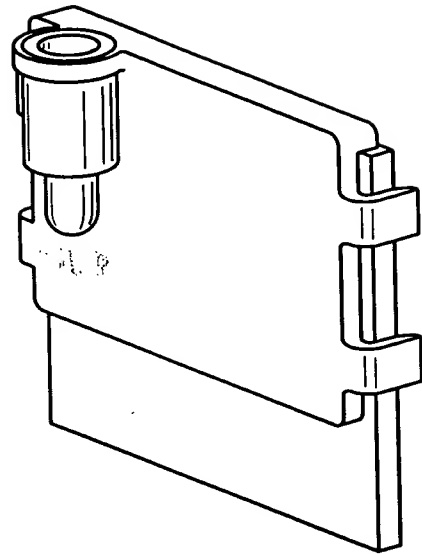
**FIG. 3F**



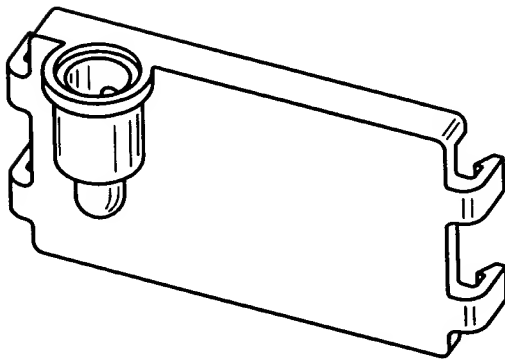
**FIG. 3G**



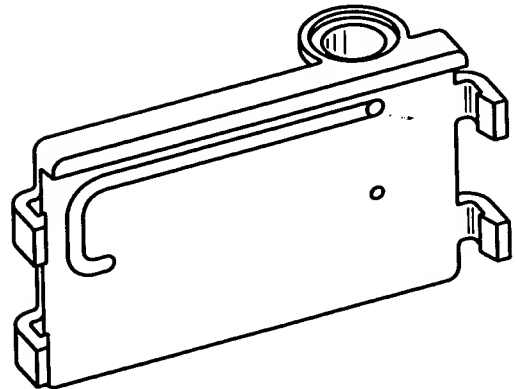
**FIG.\_4A**



**FIG.\_4B**

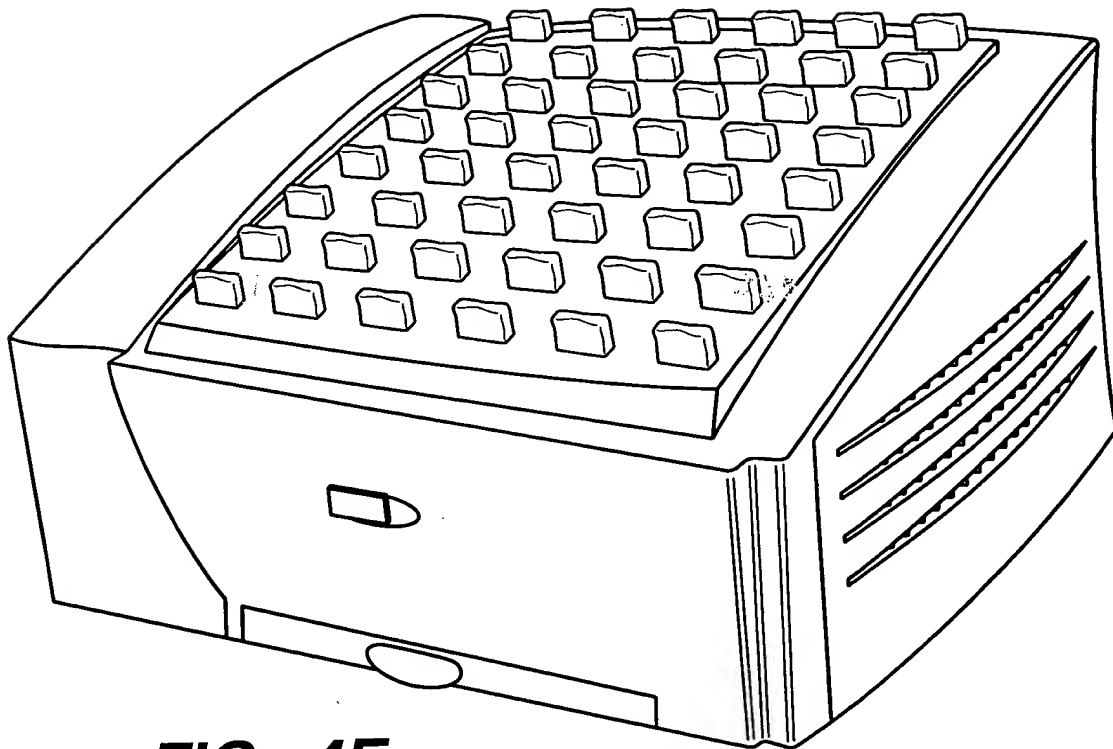


**FIG.\_4C**

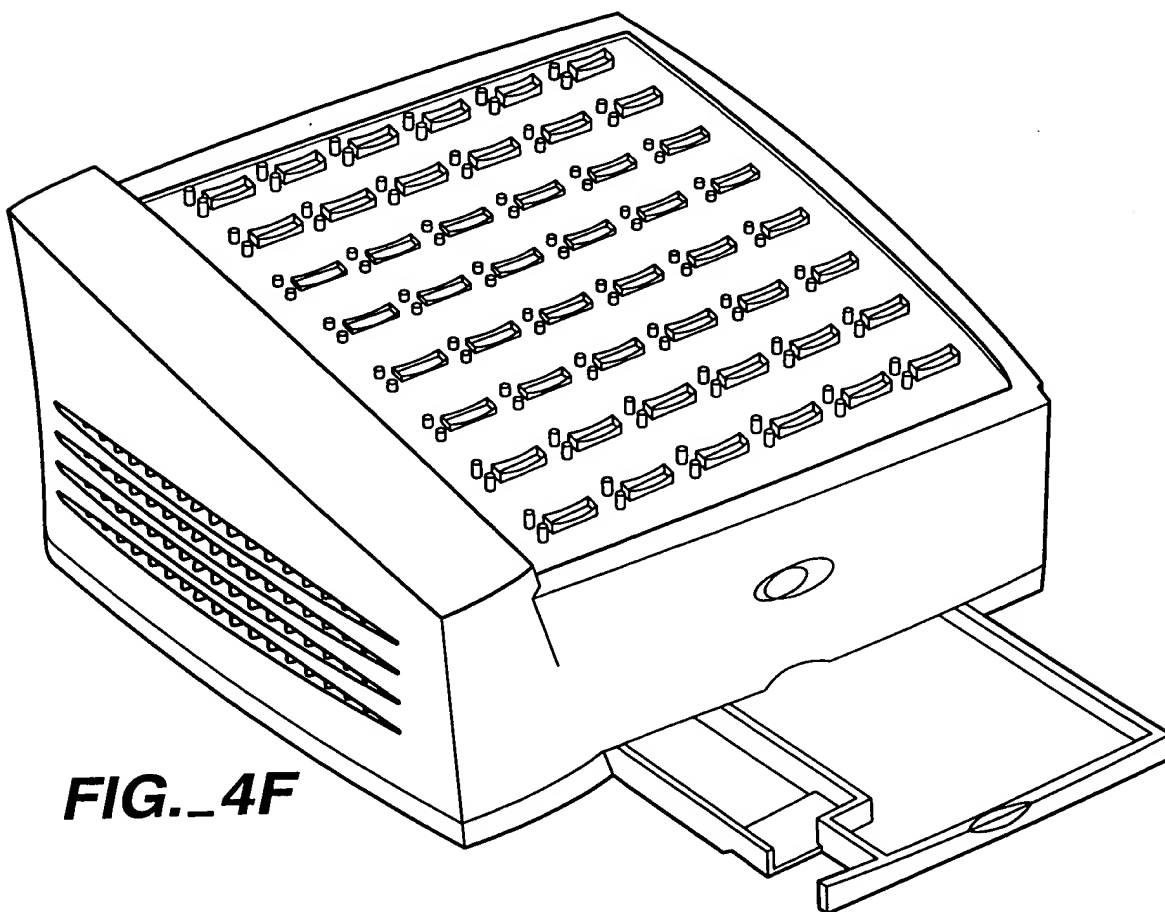


**FIG.\_4D**

FIG. 4A



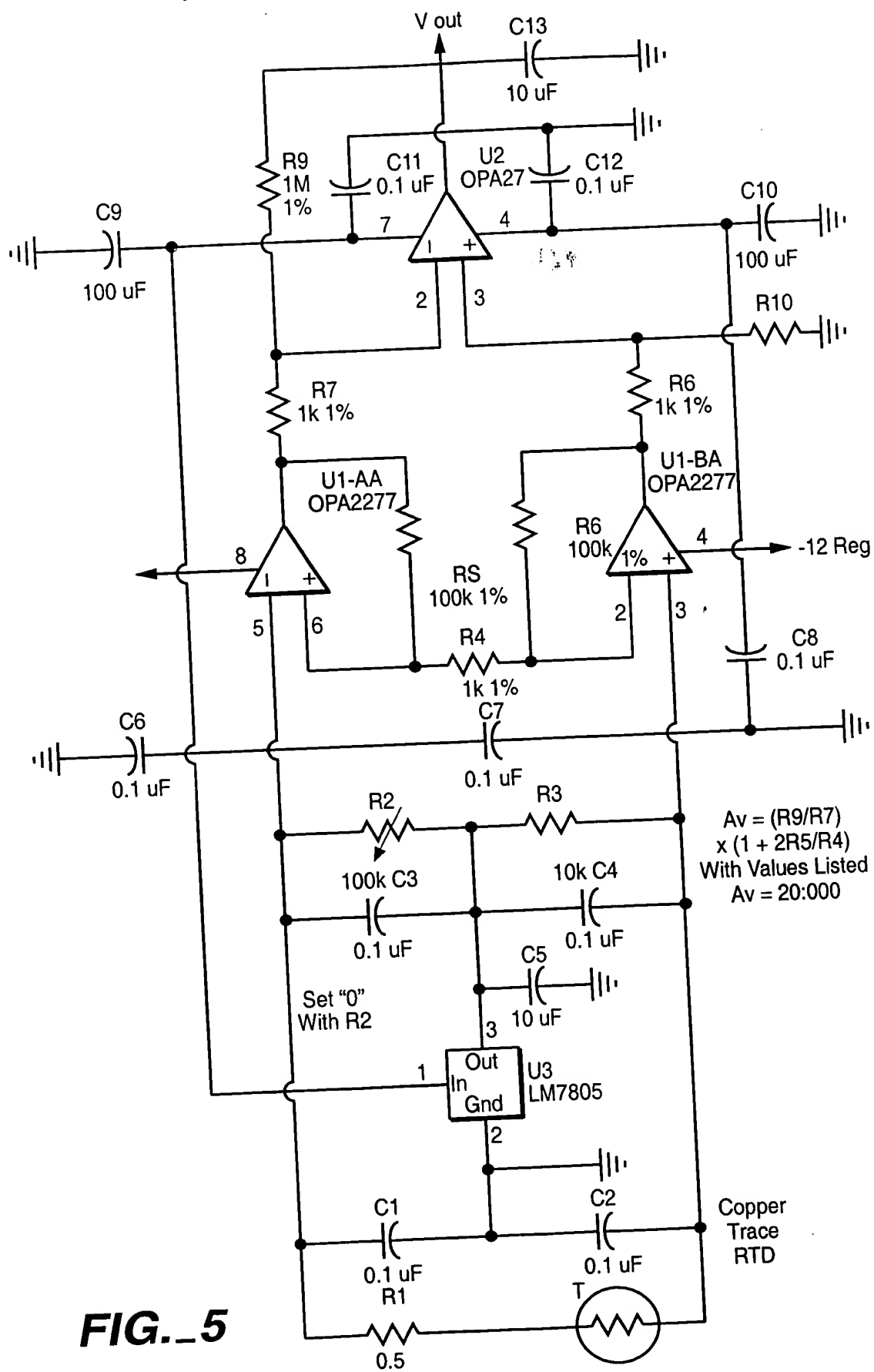
**FIG. 4E**

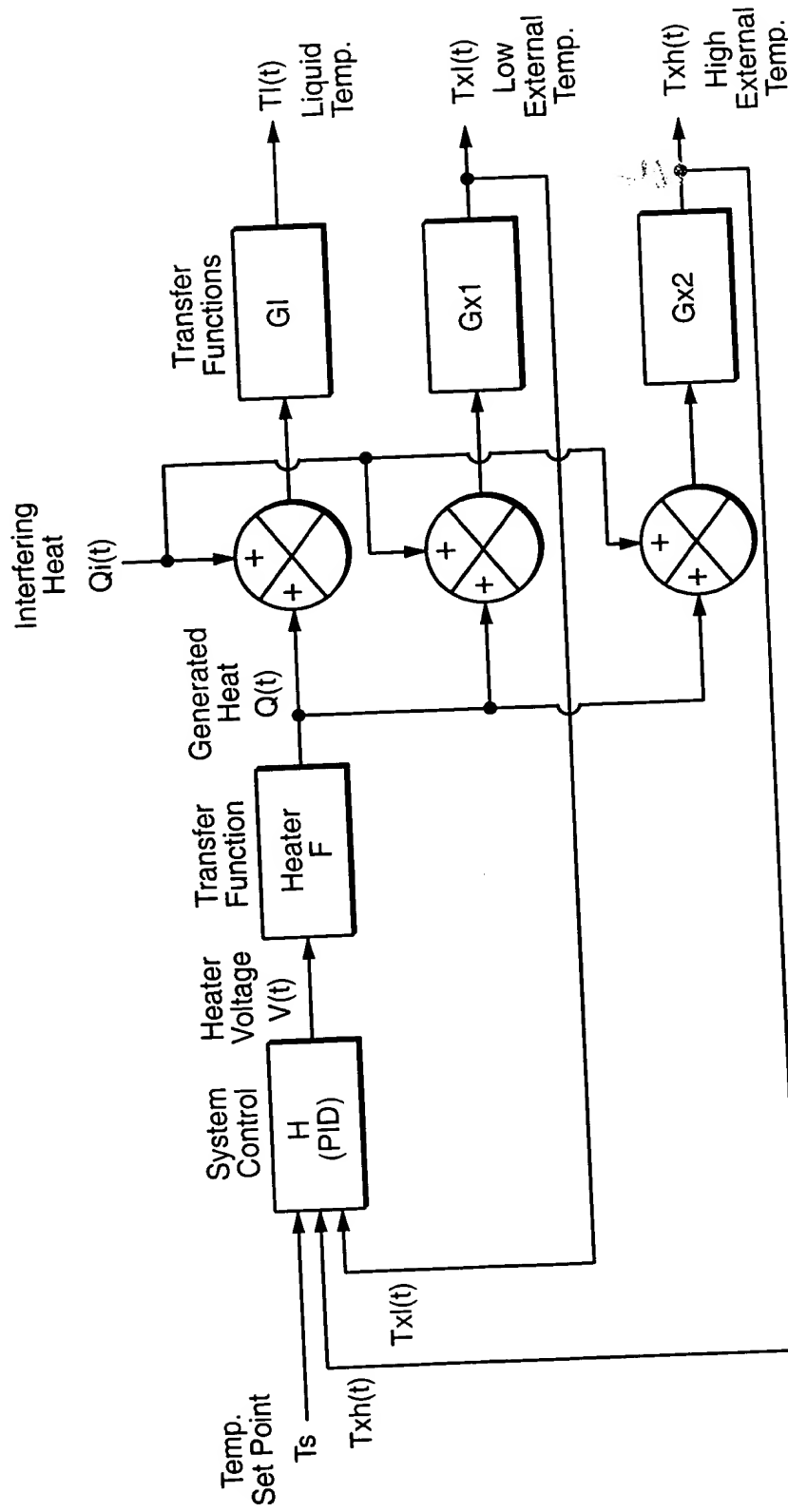


**FIG. 4F**

FIG. 4E

+





$Q(t)$  = Generated Heat (Driven)  
 $Q_i(t)$  = Interfering Heat (Unknown)  
 $F, G_l, G_{x1}, G_{x2}$  = Transfer Functions (Unknown)  
 $H$  = System Control Function (tbd)

$T_s$  = Temperature Set Point  
 $T_{x1}$  = External Temperature 1, Low (Measured)  
 $T_{x2}$  = External Temperature 2, High (Measured)  
 $T_l$  = Liquid Temperature (Desired)  
 $V(t)$  = Heater Voltage (Driven)

FIG.\_6

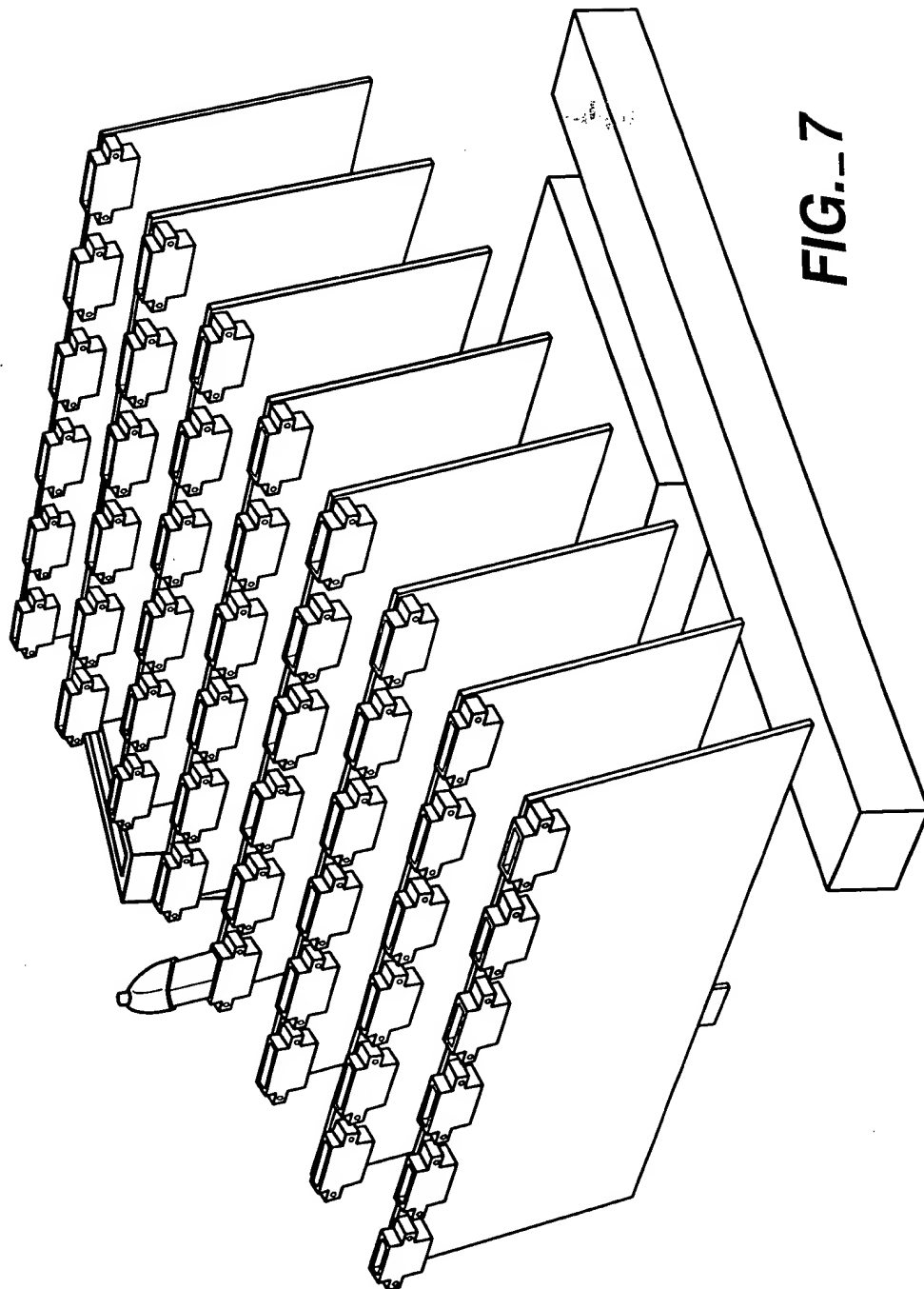
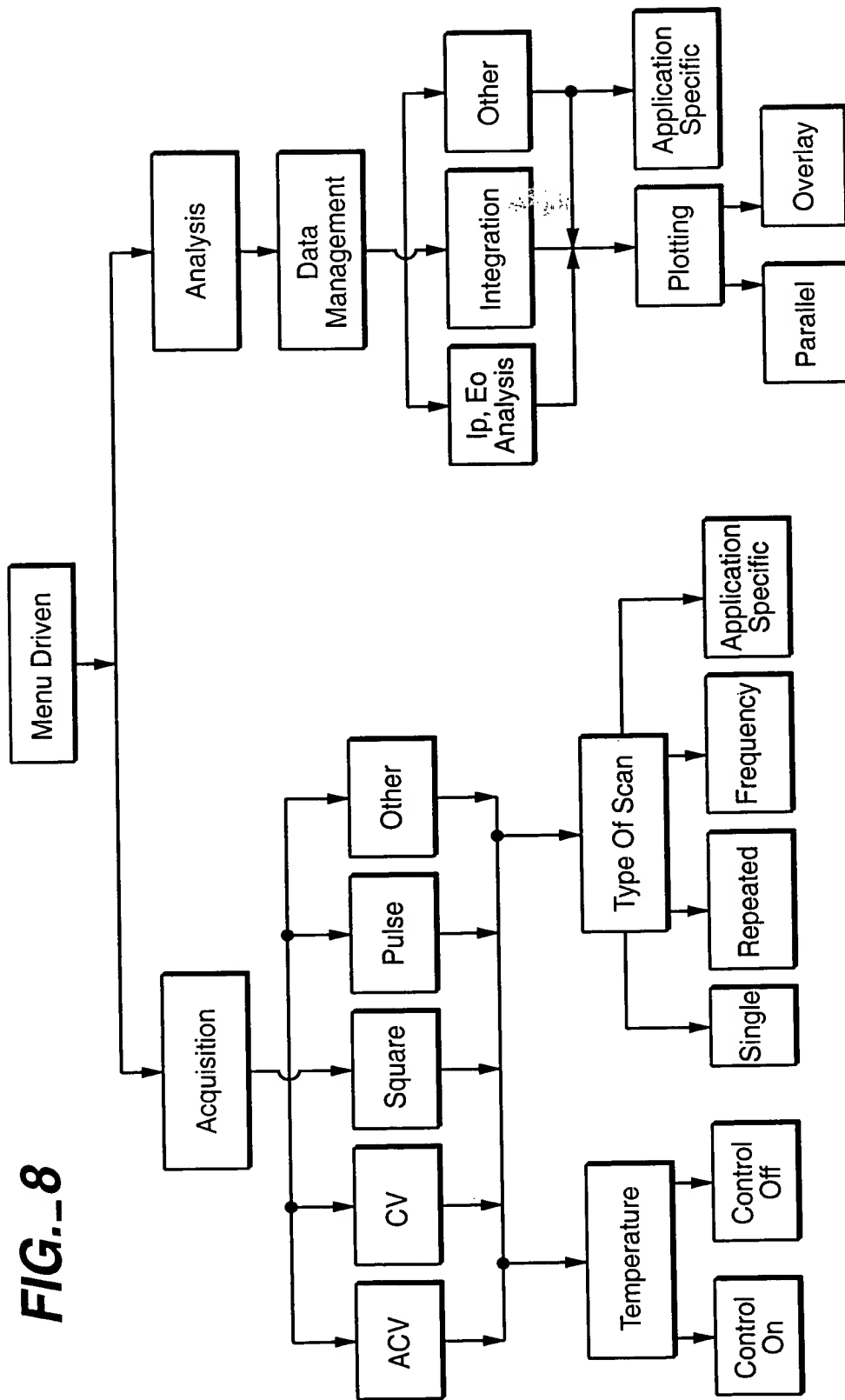
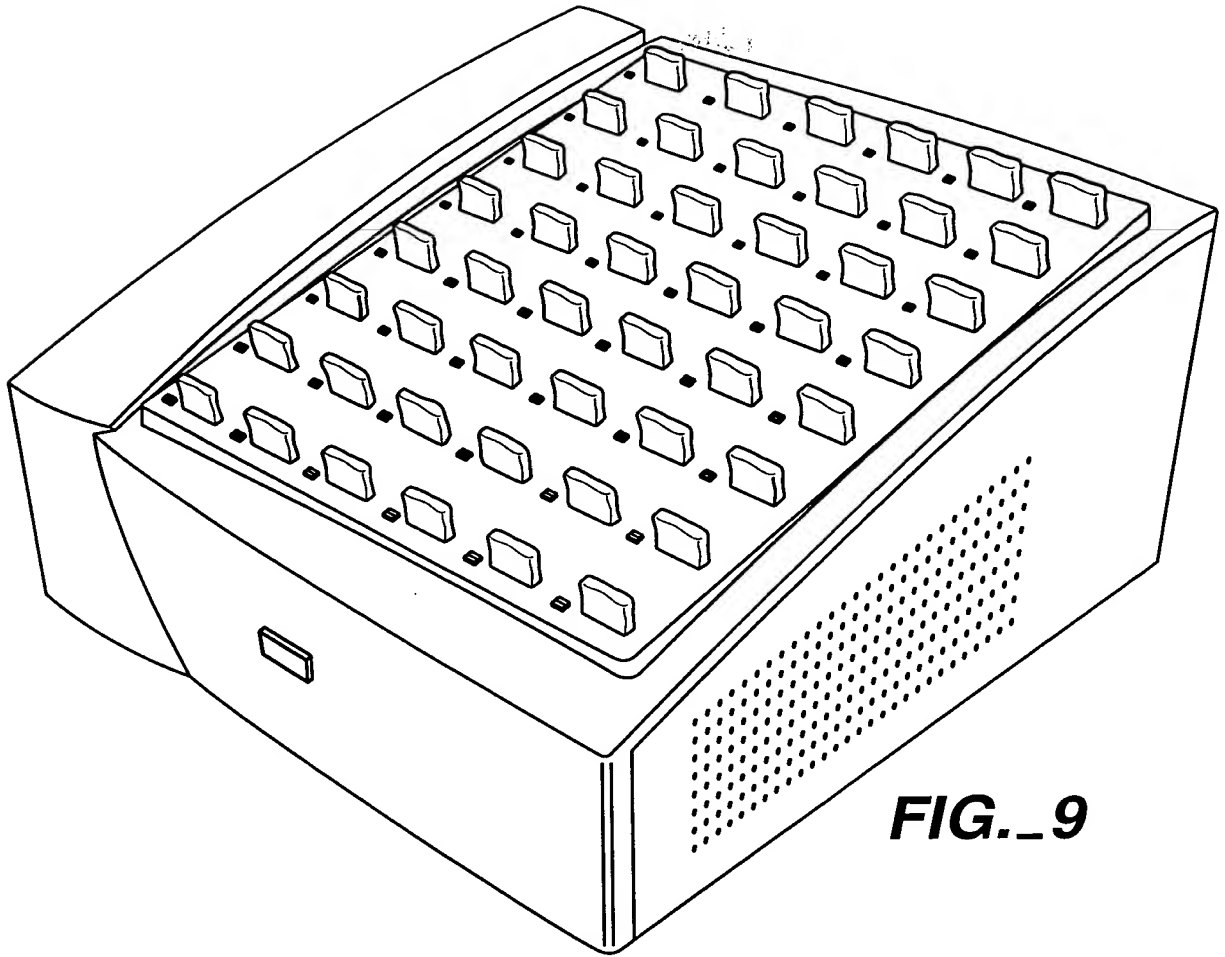


FIG. 7

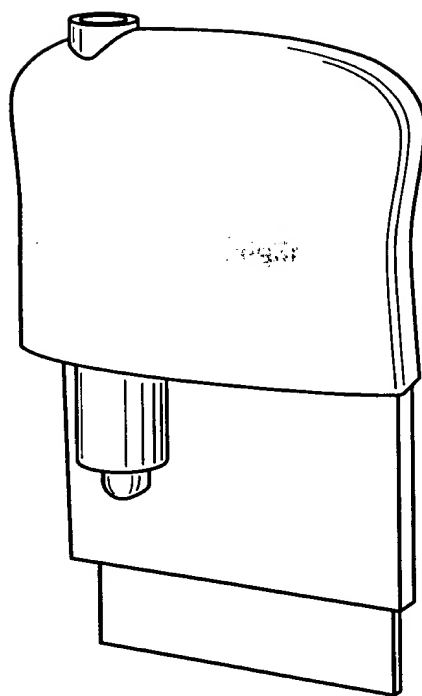
FIG. 8



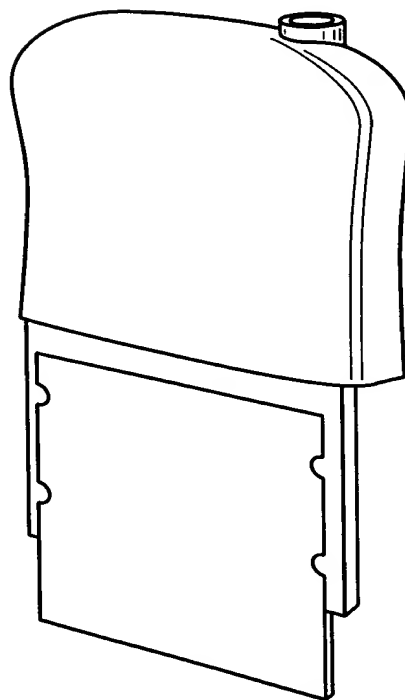


**FIG.\_9**

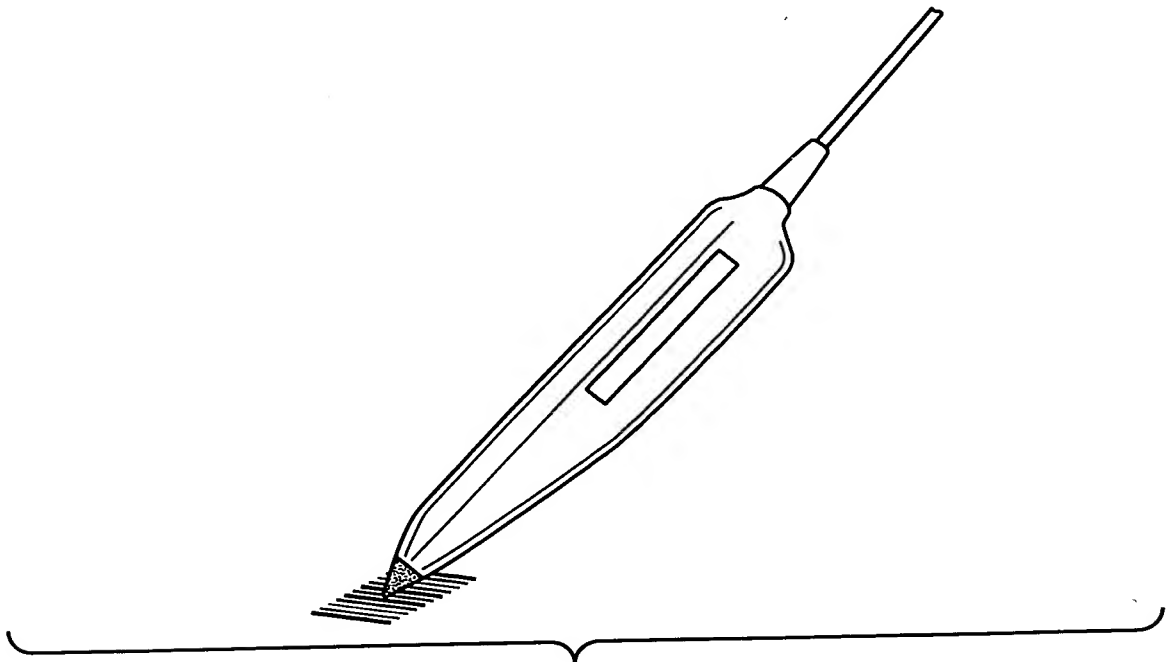
**FIG.\_10A**



**FIG.\_10B**



- Bar coded "reference" sheet, stored in tray under unit, with bar coded protocols, bar coded well and slot id's, bar coded commands (e.g. "cancel", "done", etc.)
- Standard bar code wand (preferably with built-in decoder), housed in the tray (hence hidden when not in use)
- Serial (RS-232/485) interface (preferred), or "keyboard wedge"
- Multi-code support (Code 39, Code 128, etc.)
- Bar code on chip carrier (1 code per "8 pack"), identifying test, batch, etc.
  - Peel off labels, with same code as on carrier, with each "8 pack"



**FIG. 11**

FIG. 11

■ Bar code usage scenario

- User fills "8-pack" (all 8, or partially) from a 96 well plate, or from individual sample containers (PCR tubes, vaccutainers, etc.)
- Pull out tray (with bar code reference sheet) and grab wand
- Scan "start" code
- Scan protocol code from sheet (will remain in effect until "done" is scanned)
- Scan chip code from carrier (will remain in effect until "done" is scanned)
- For each cartridge, user will
  - insert the cartridge in an open slot. Unit senses new chip automatically
  - scan the sample ID by either
    - scanning 96 well plate bar code from plate and well code from sheet
    - or scanning unique sample ID from container
    - or scanning "no ID" from reference sheet
- Scan "done" code. The protocol can' now be started on these cartridges

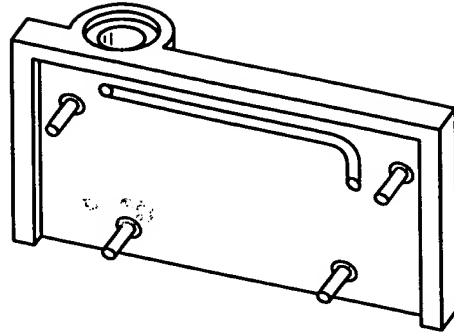
**FIG.\_ 12**

■ Bar code concept benefits

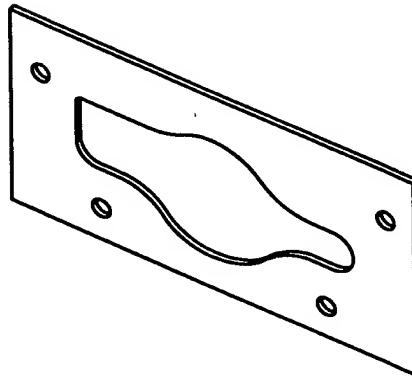
- No keyboard entry (all-routine setup can be entered via bar coding)
- All routine entries accomplished while in front of unit (no going back & forth between PC & Hydra)
- All bar code entries done from small, flat surface in front of unit
- No need to label each chip or each slot (which would compromise appearance)
- Uses small unobtrusive bar code wand, hidden when not in use
- Is flexible with respect to sample container (tube, 96 well plate, etc.), chip usage (by row of 8, or by individual chip), and lab bar coding method

**FIG.\_ 13**

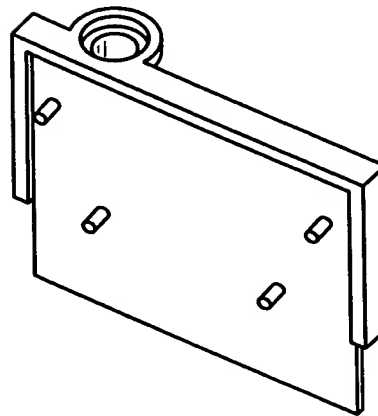
**FIG.\_14A**



**FIG.\_14B**



**FIG.\_14C**



**FIG.\_14D**

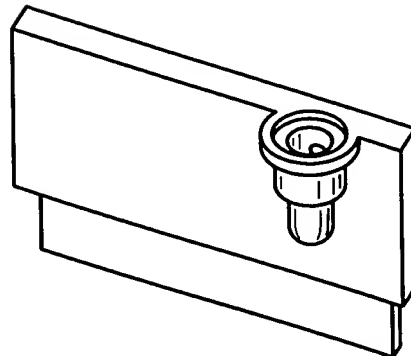
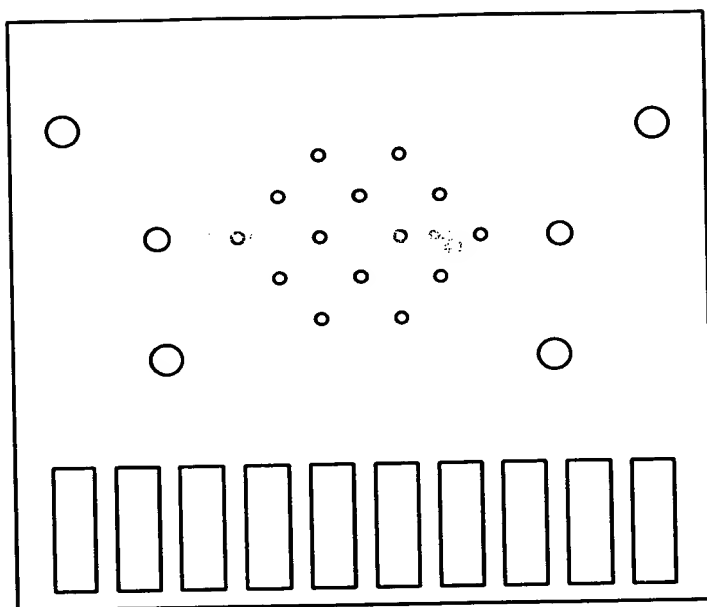
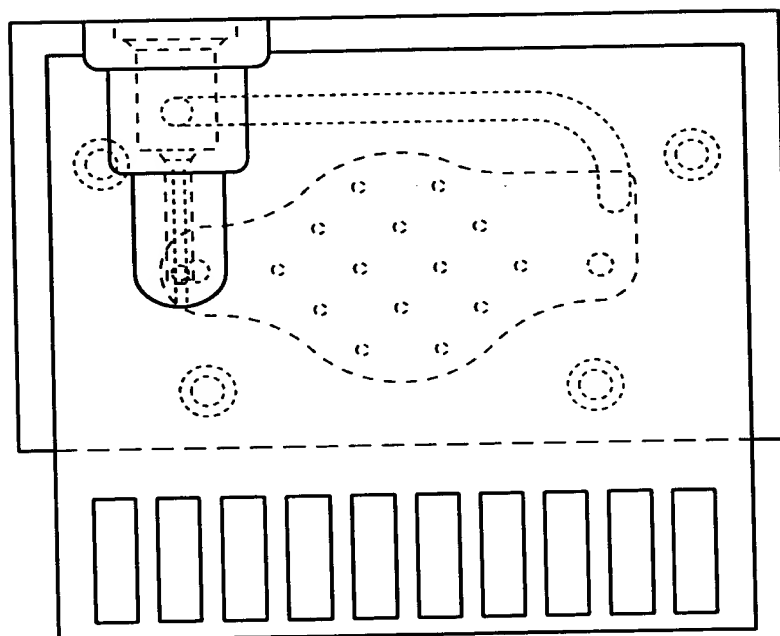


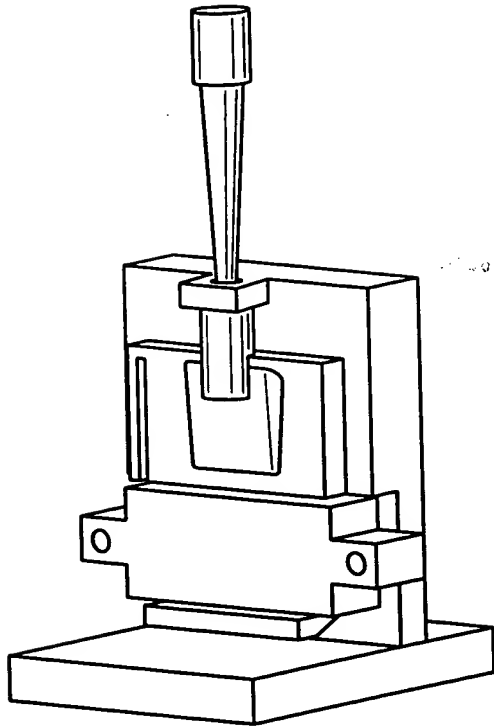
FIG. 14E



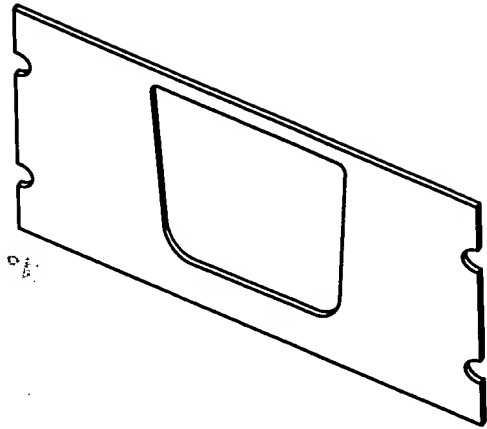
**FIG.\_14E**



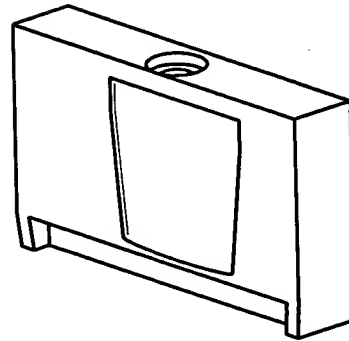
**FIG.\_14F**



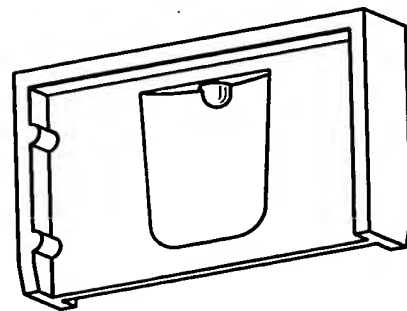
**FIG. 15A**



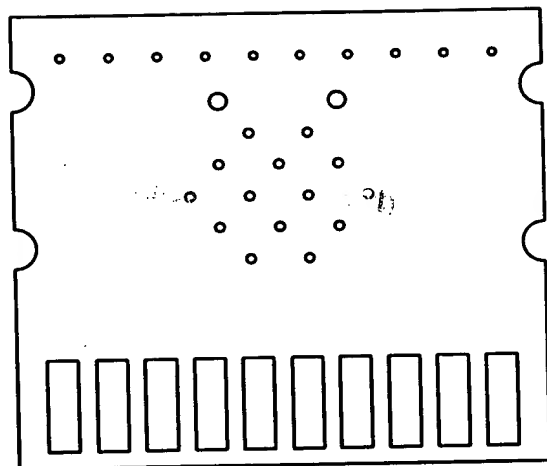
**FIG. 15B**



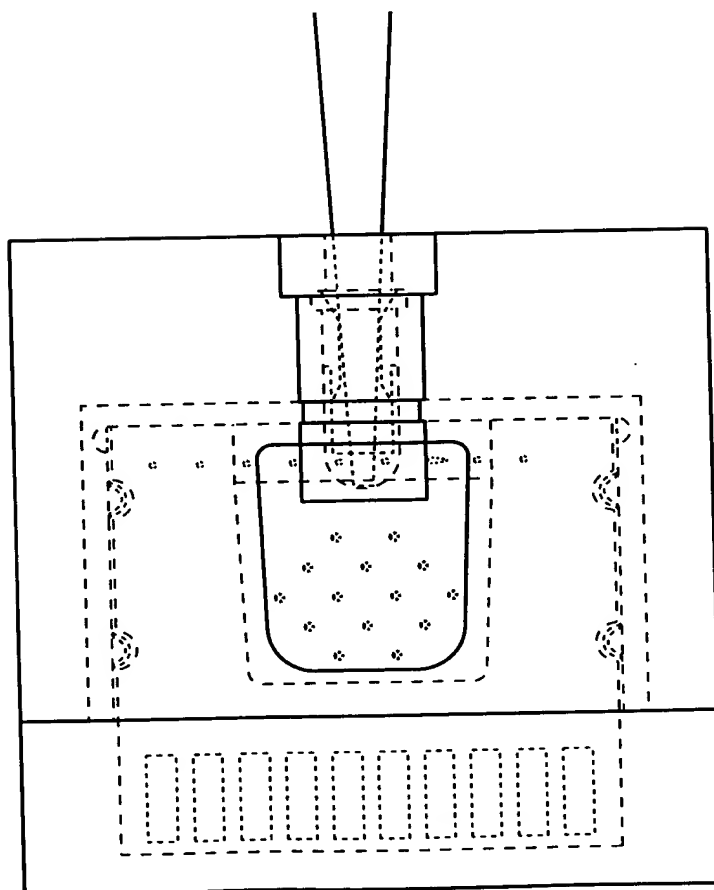
**FIG. 15C**



**FIG. 15D**

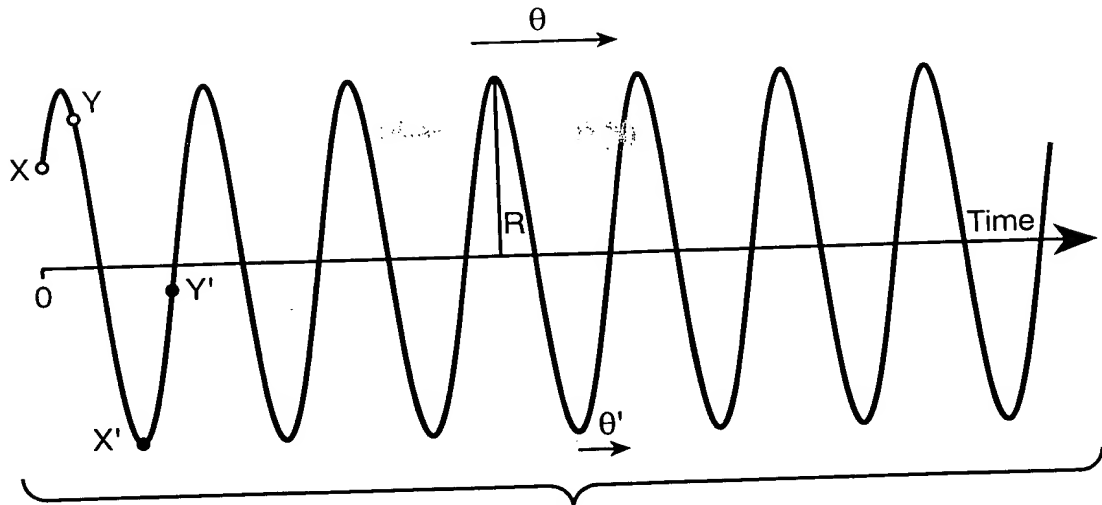


**FIG. 15E**

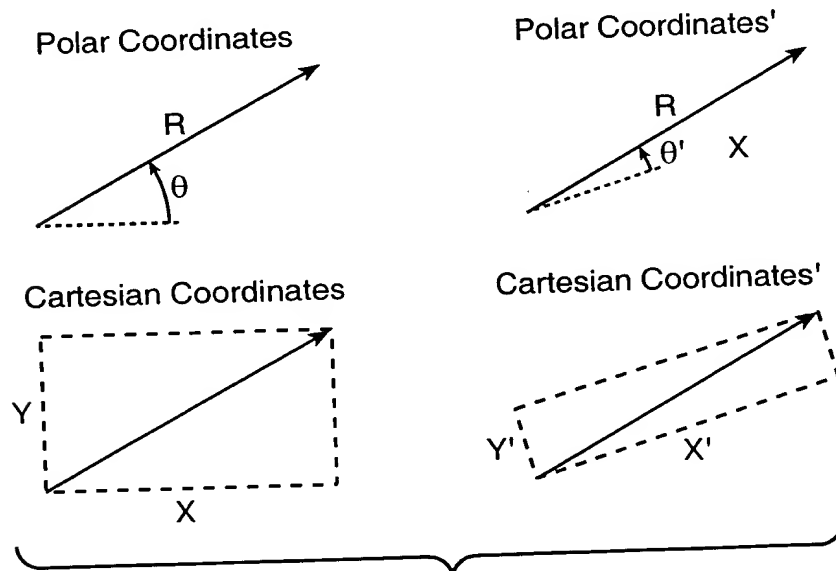


**FIG. 15F**

# A Sine Wave And Its Corresponding Vector Notation

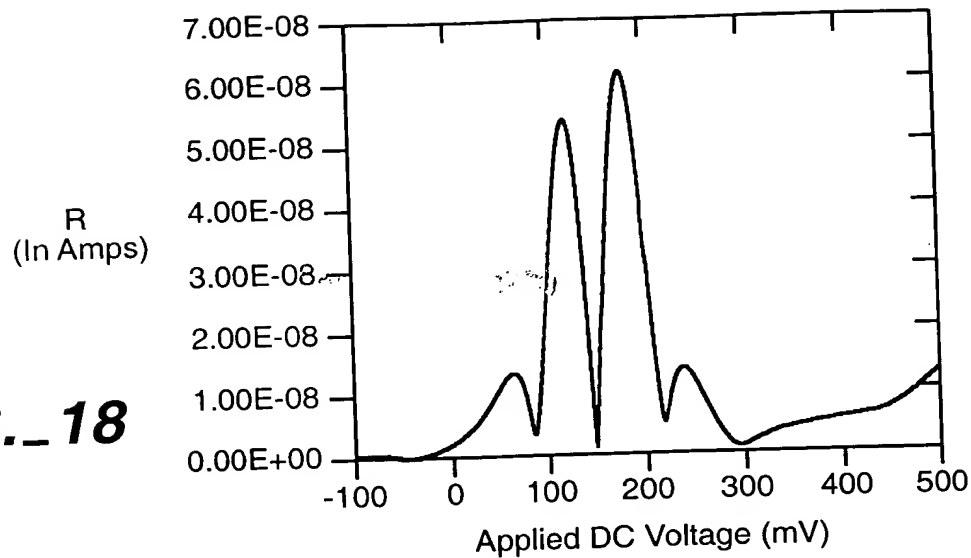


**FIG.\_16**

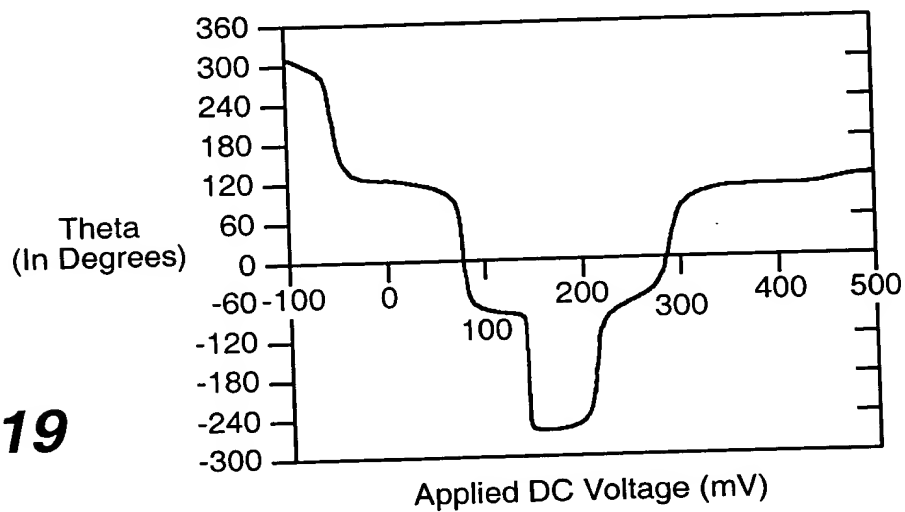


**FIG.\_17**

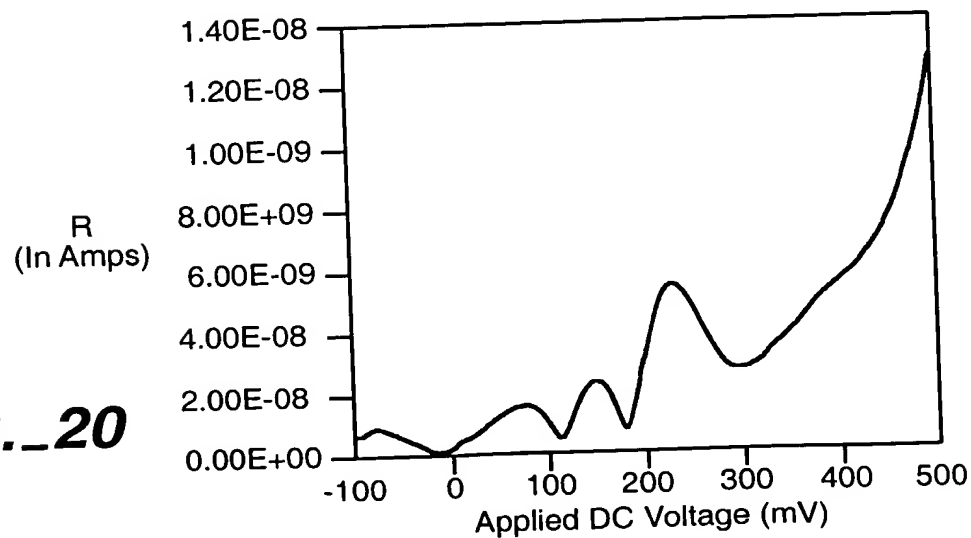
**FIG.\_18**



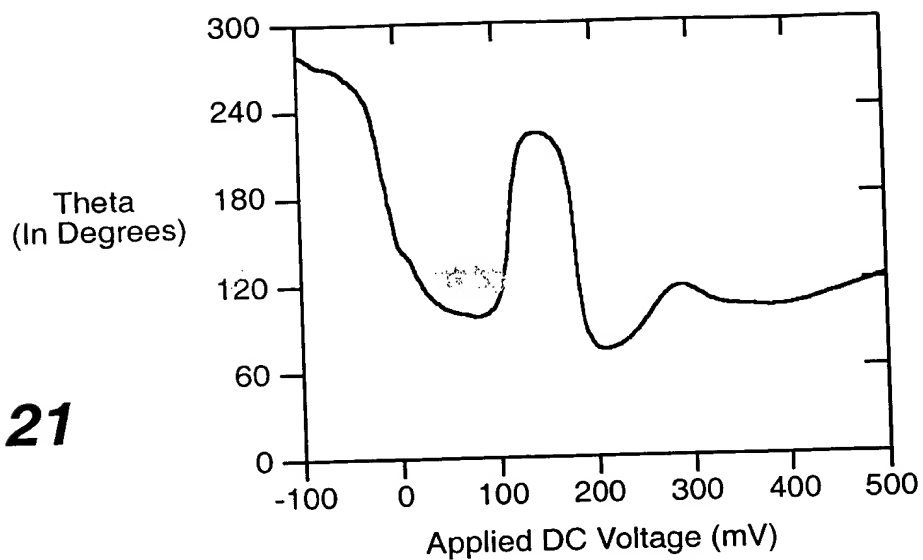
**FIG.\_19**



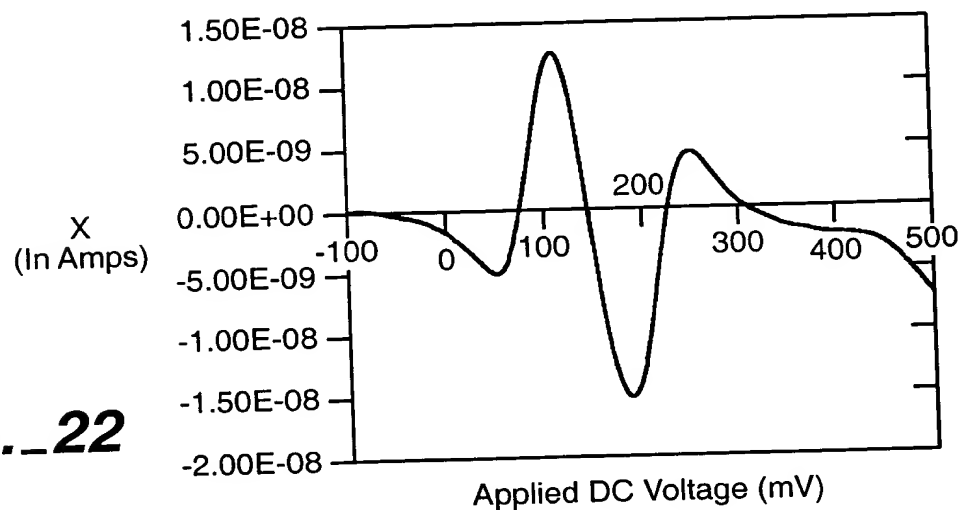
**FIG.\_20**



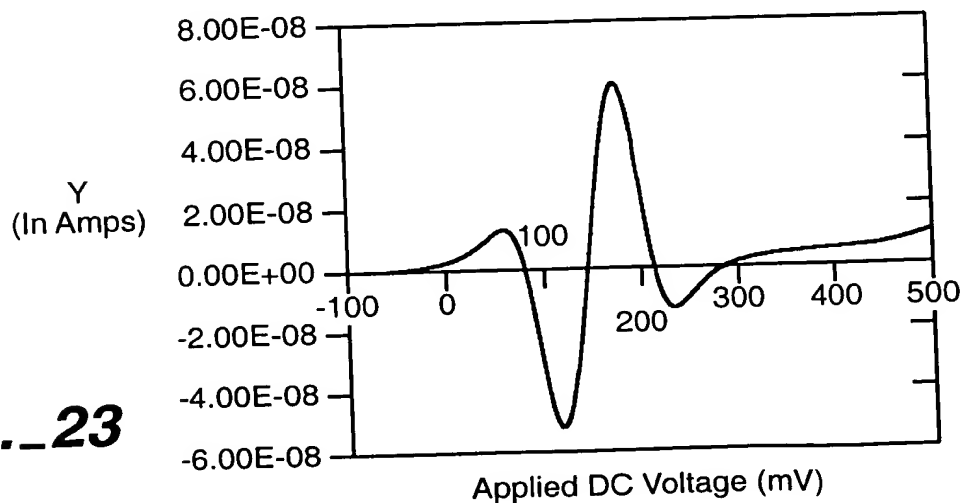
**FIG.\_21**



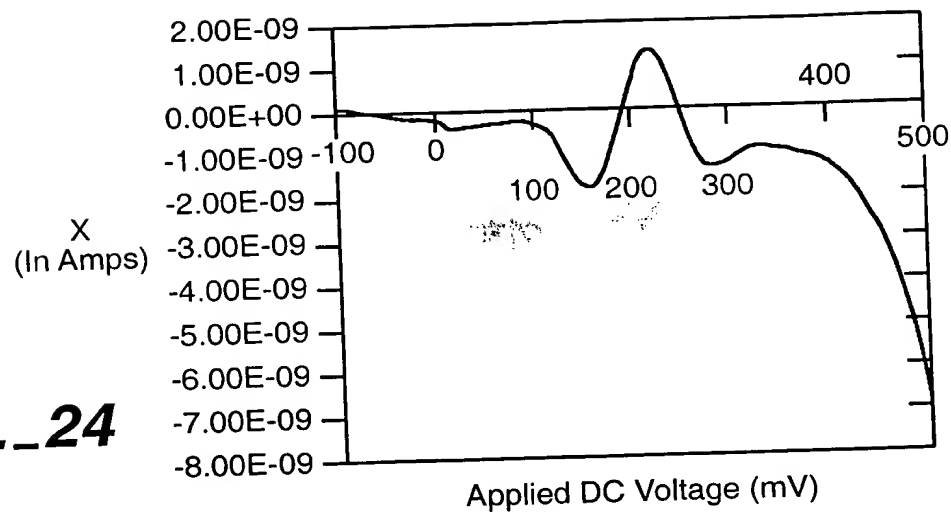
**FIG.\_22**



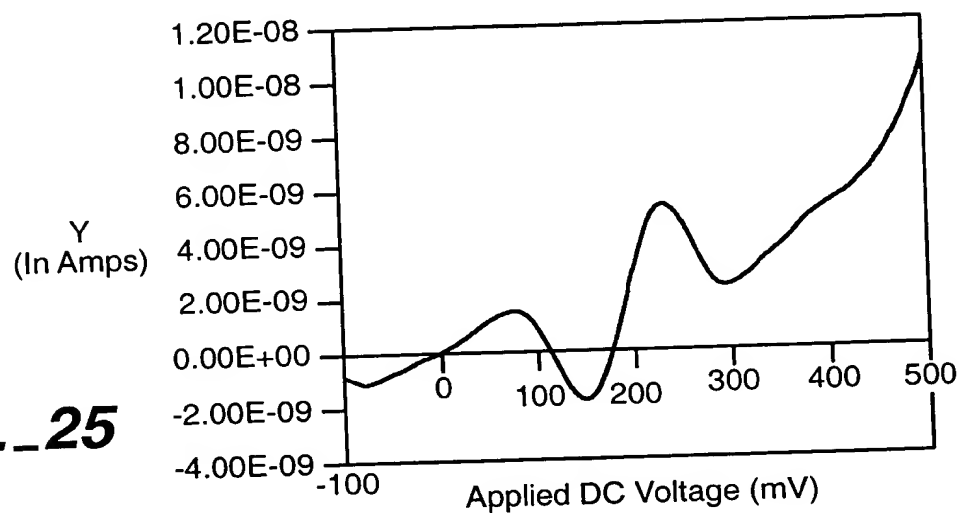
**FIG.\_23**



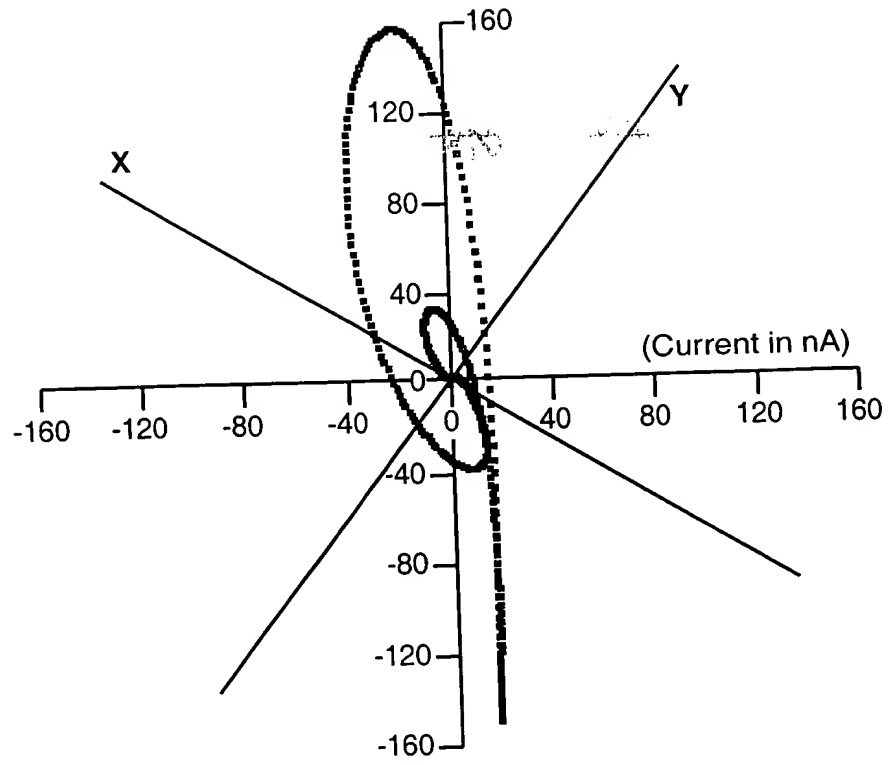
**FIG.\_24**



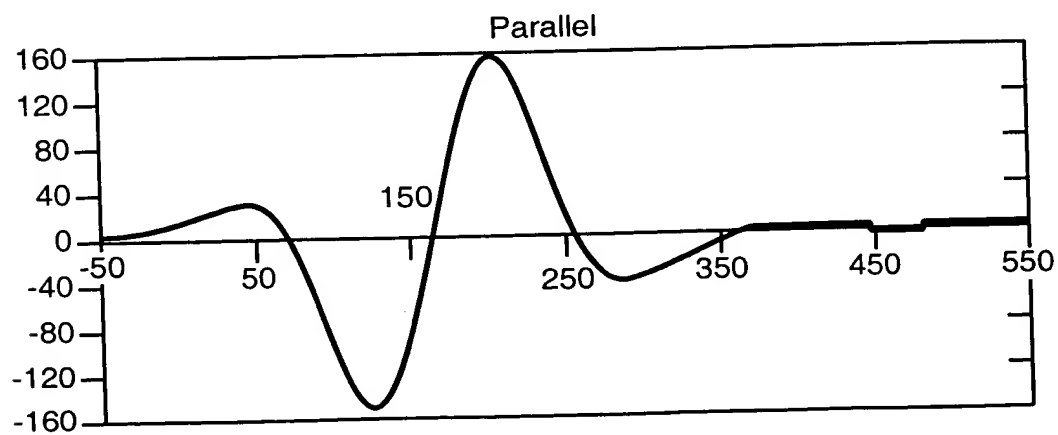
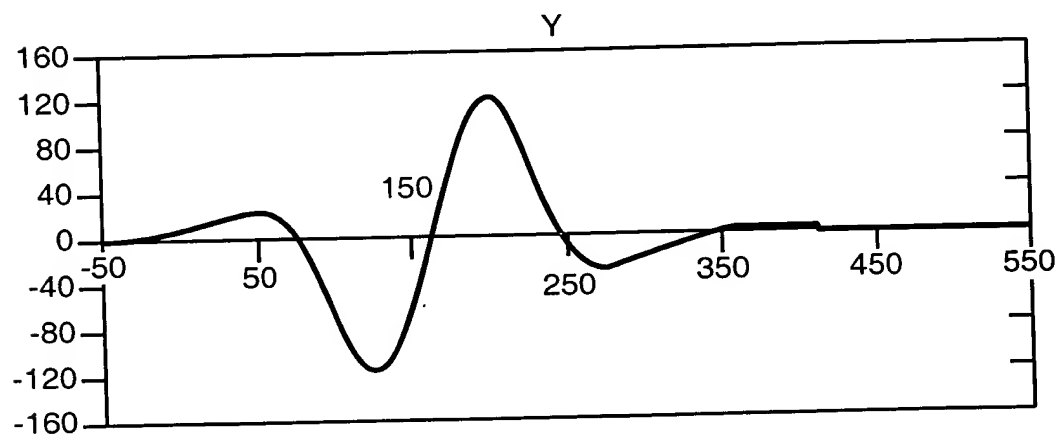
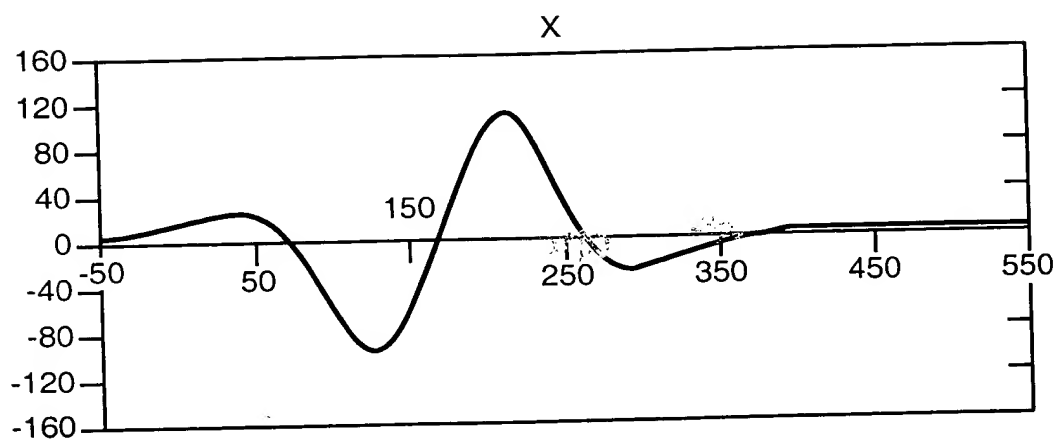
**FIG.\_25**

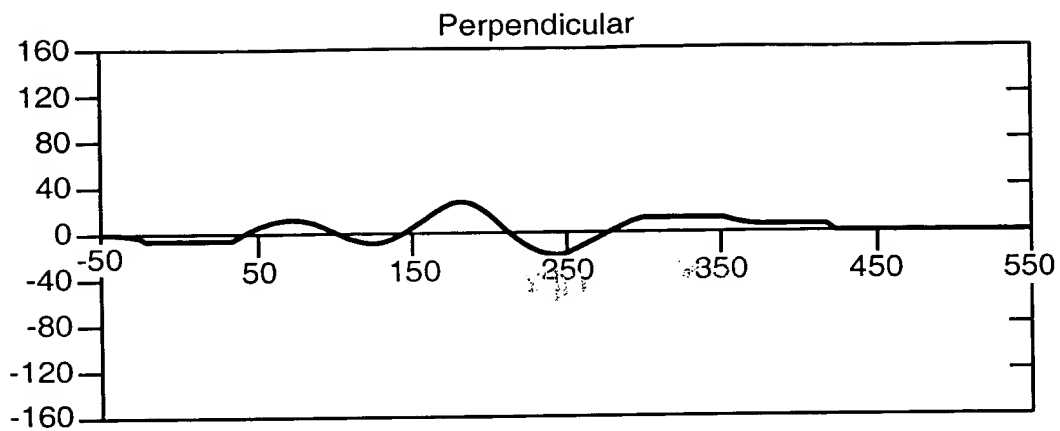


TOP SECRET

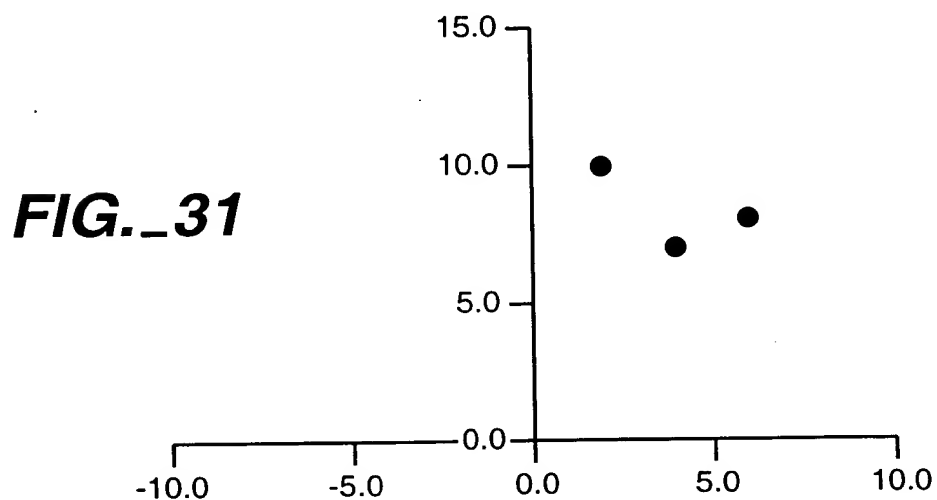


**FIG. 26**

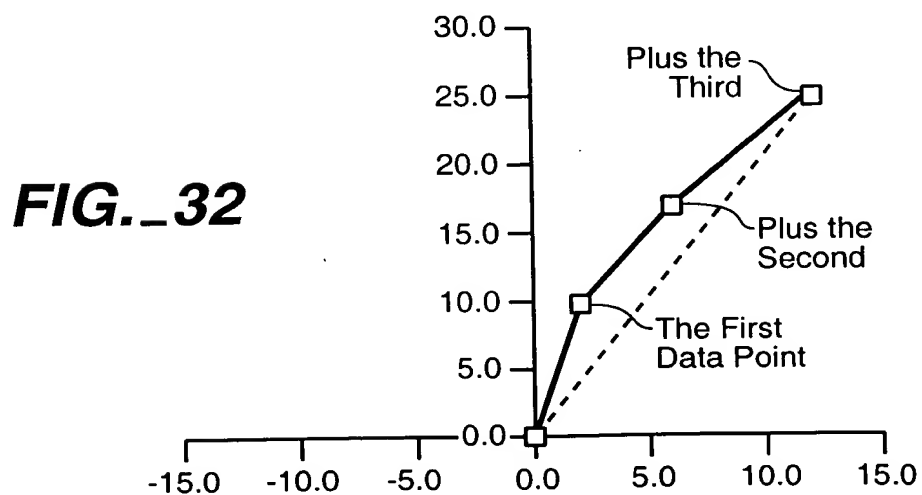




**FIG.\_30**

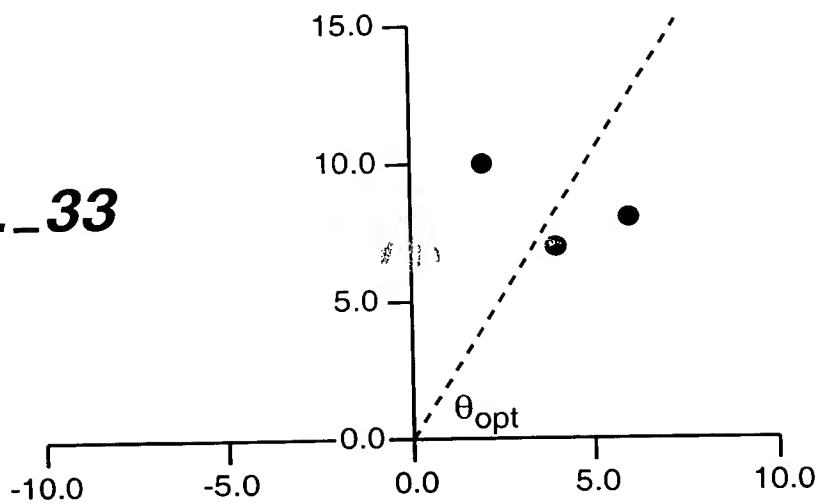


**FIG.\_31**

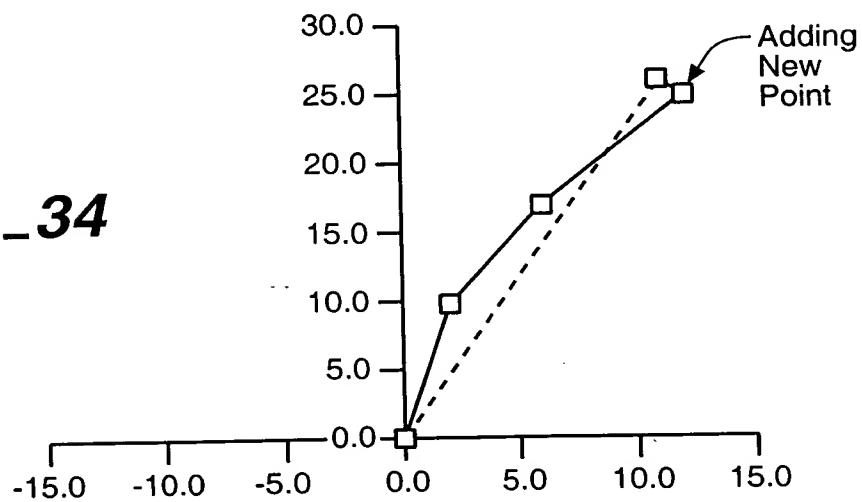


**FIG.\_32**

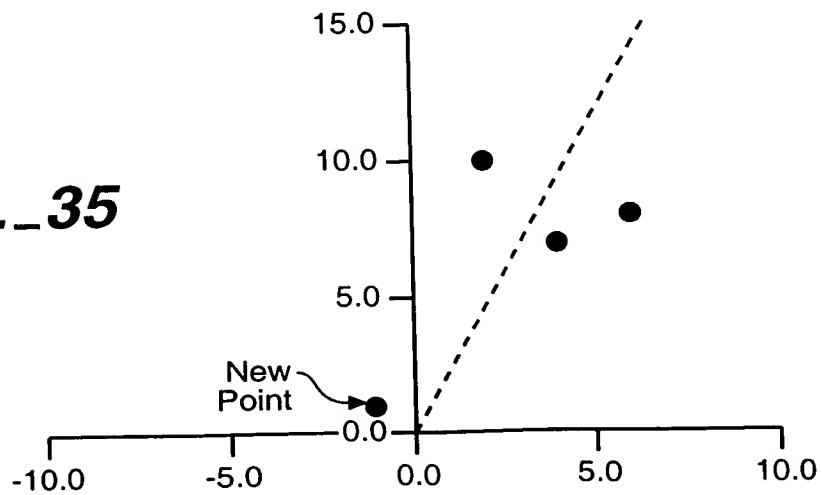
**FIG.\_33**



**FIG.\_34**



**FIG.\_35**



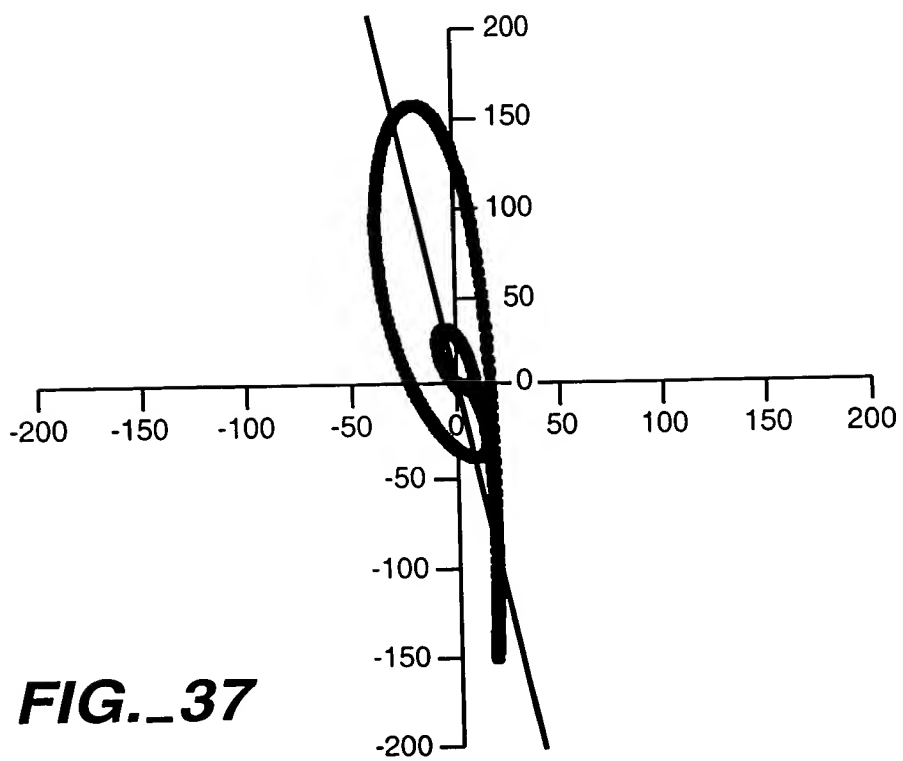
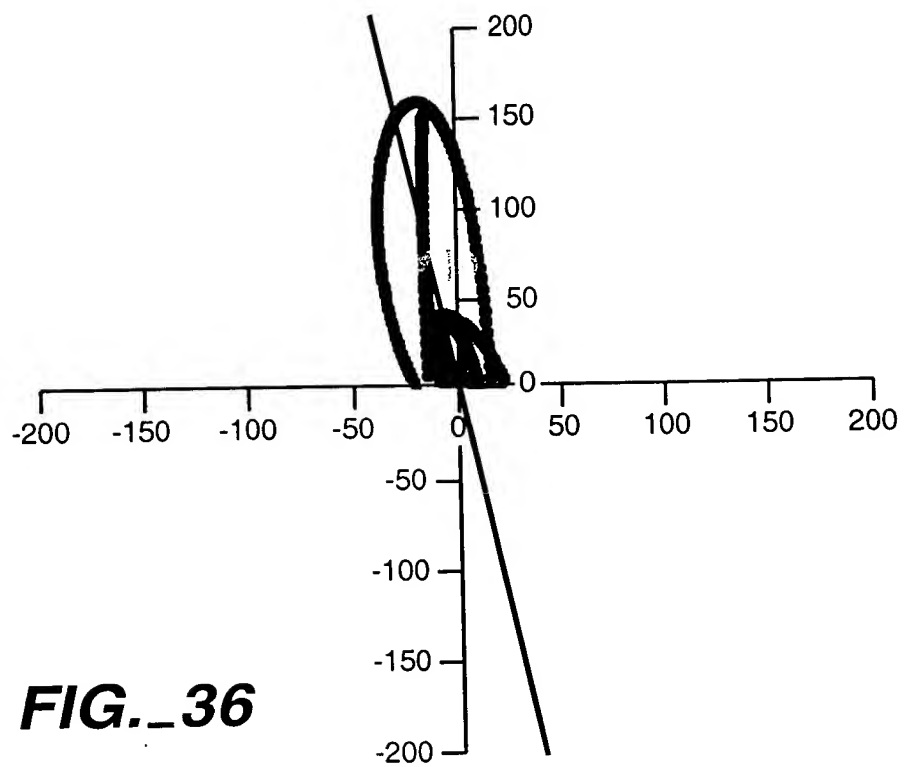
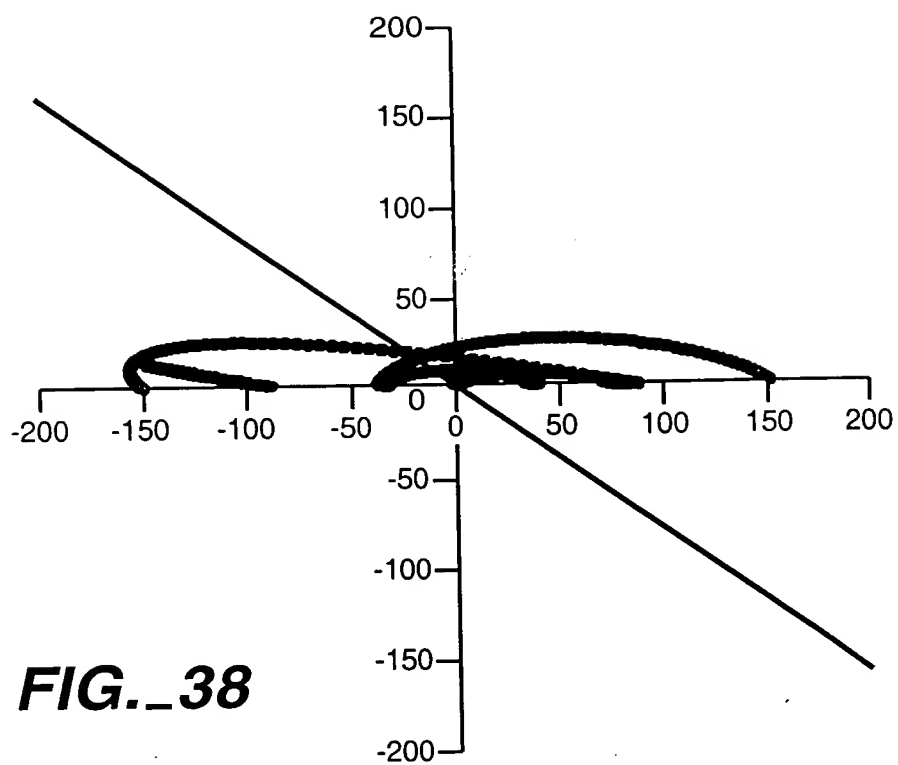
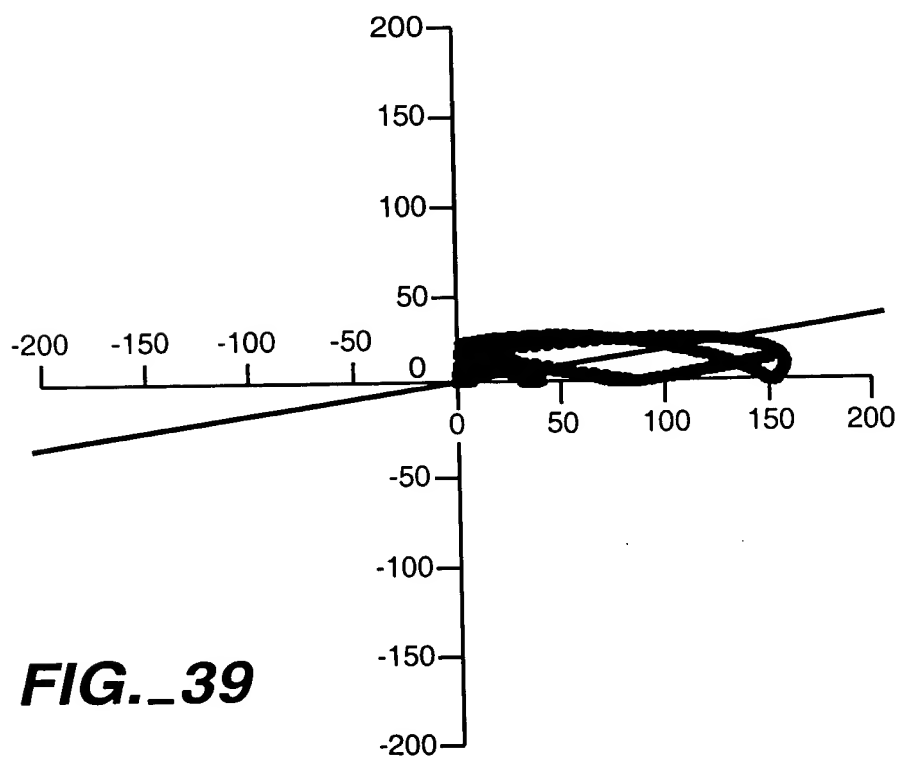


FIG. 22" 5270600

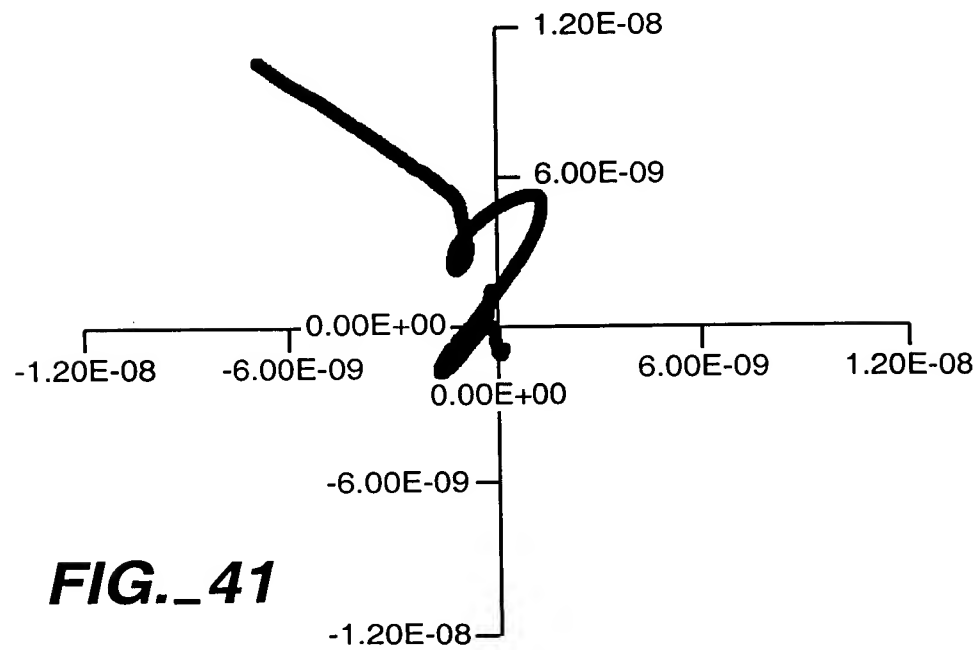
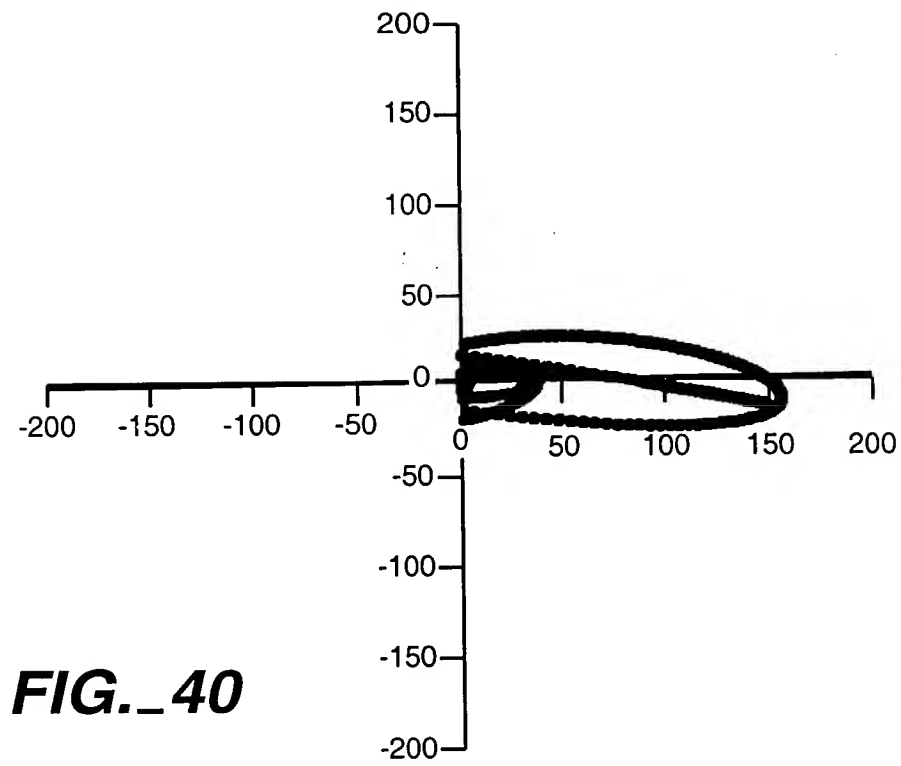


**FIG.\_38**



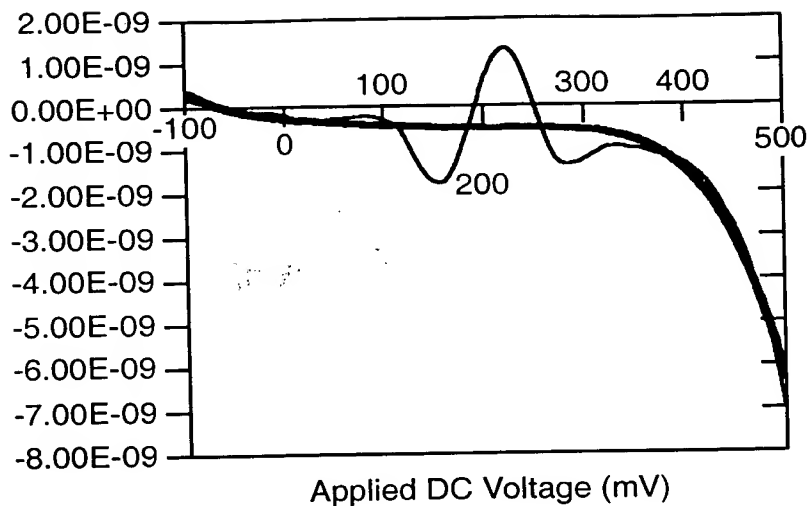
**FIG.\_39**

2025-04-20



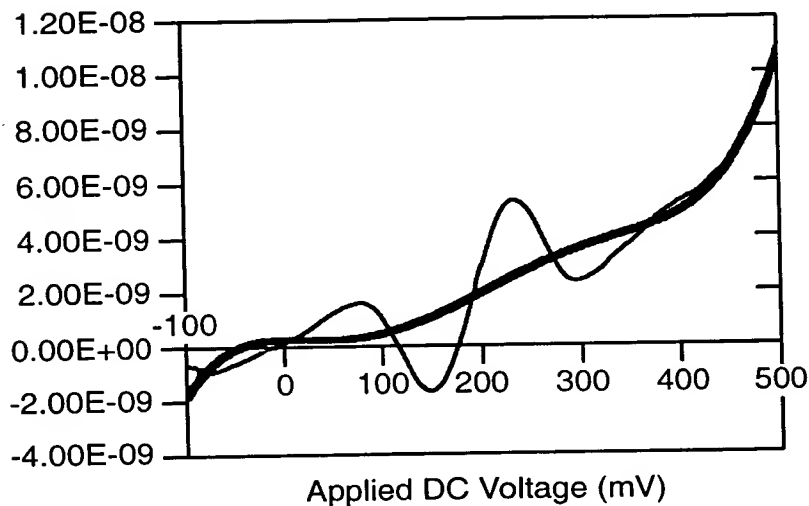
Scan Viewed  
Along  
0 Degrees

**FIG.\_42**



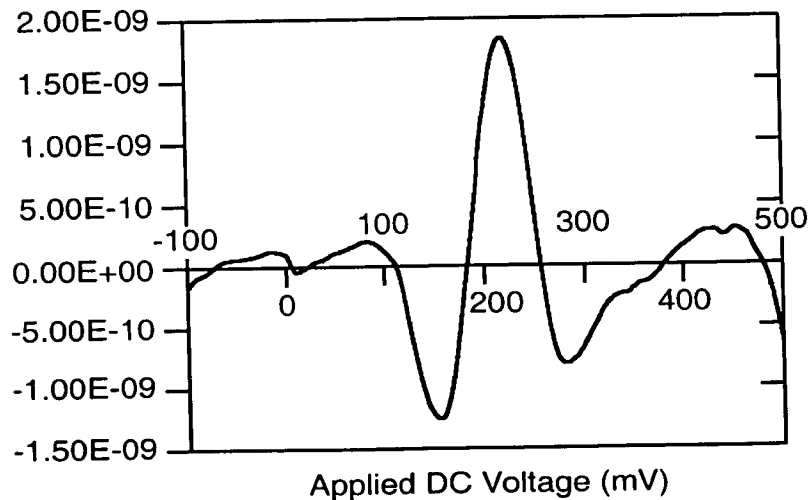
Scan Viewed  
Along  
0 Degrees

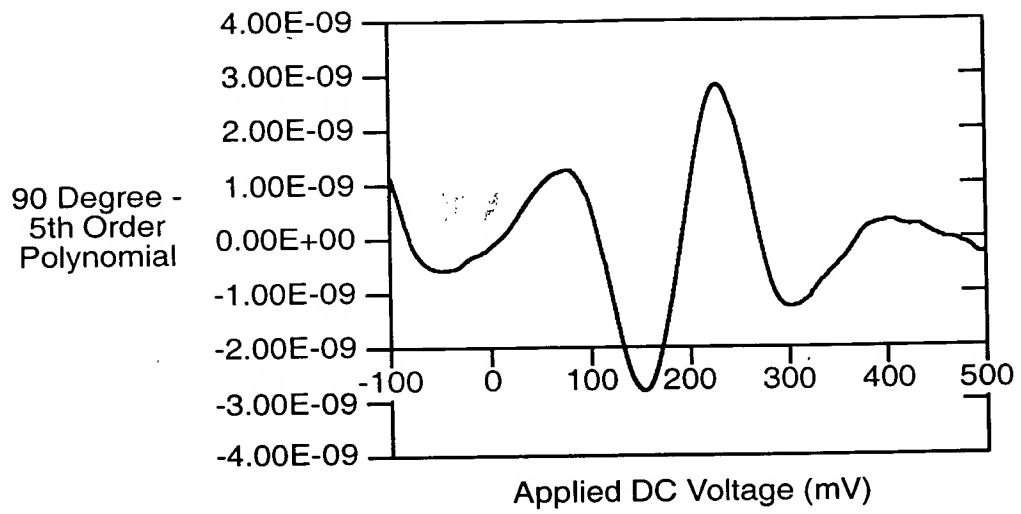
**FIG.\_43**



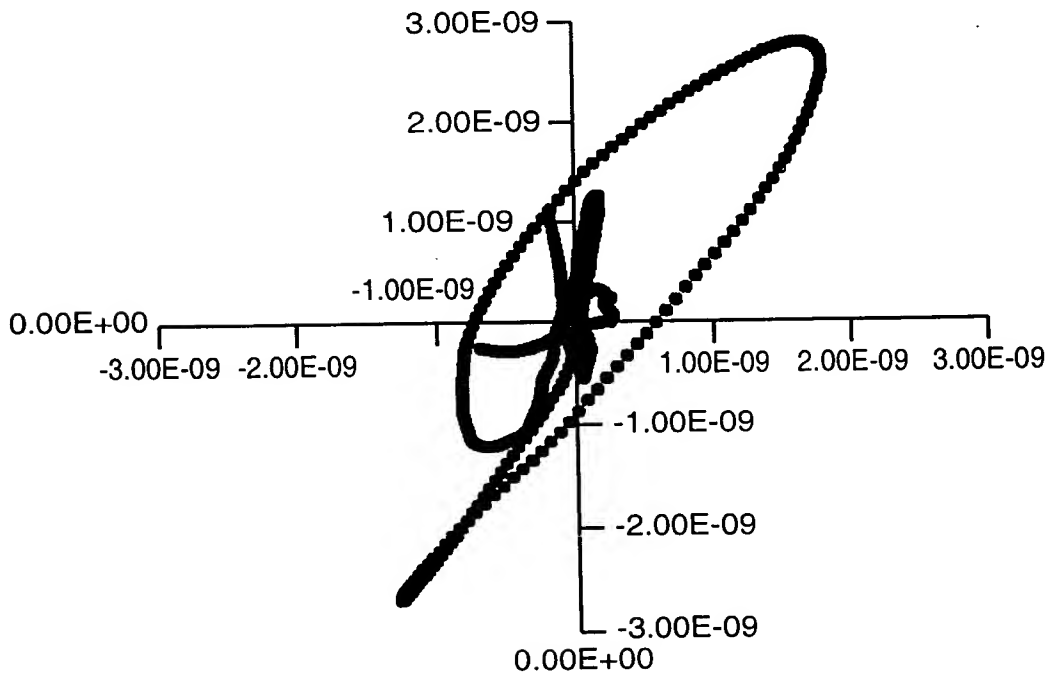
0 Deg. -  
5th Order  
Polynomial

**FIG.\_44**





**FIG.\_45**



**FIG.\_46**

Current vs. Time

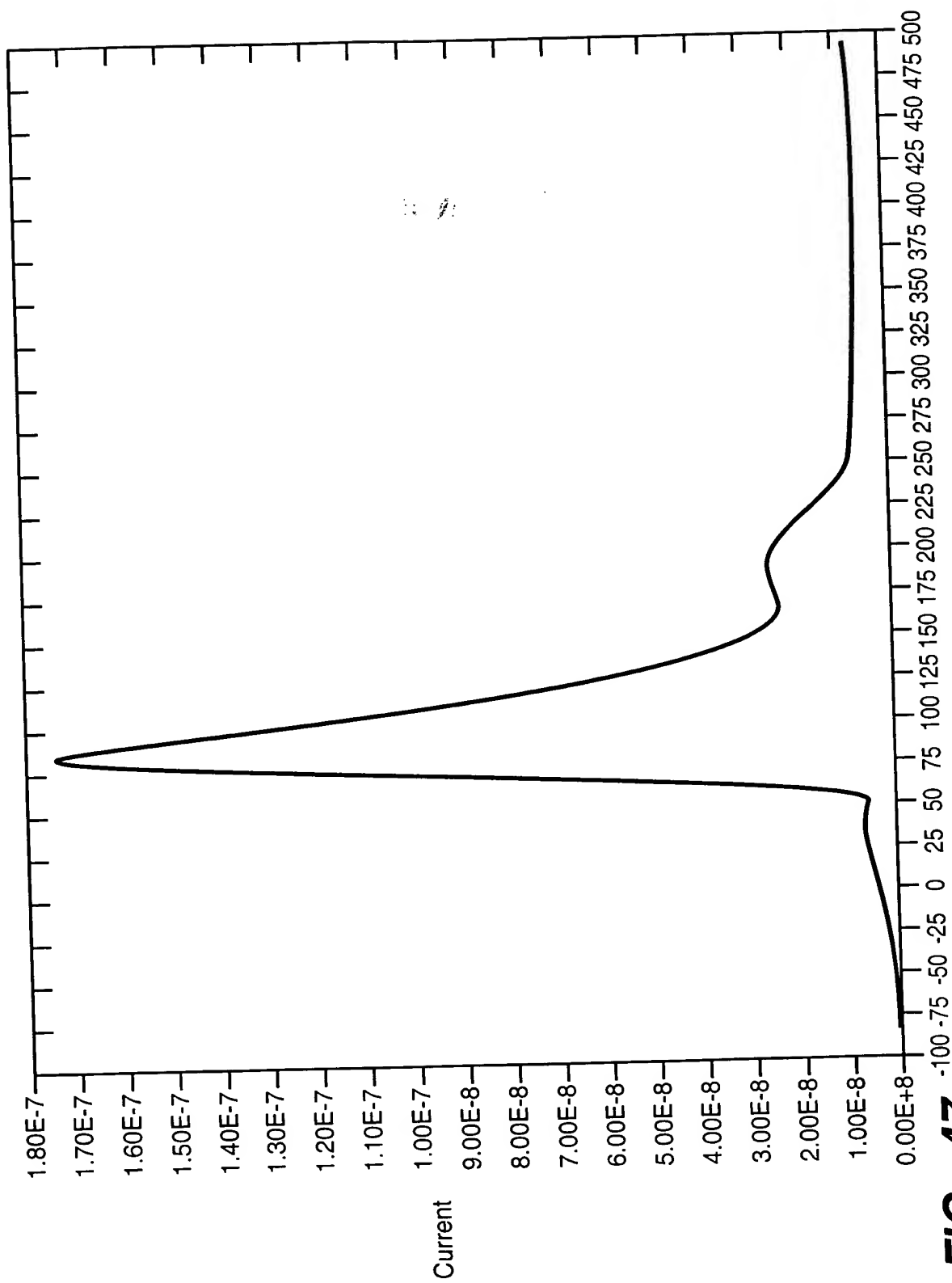
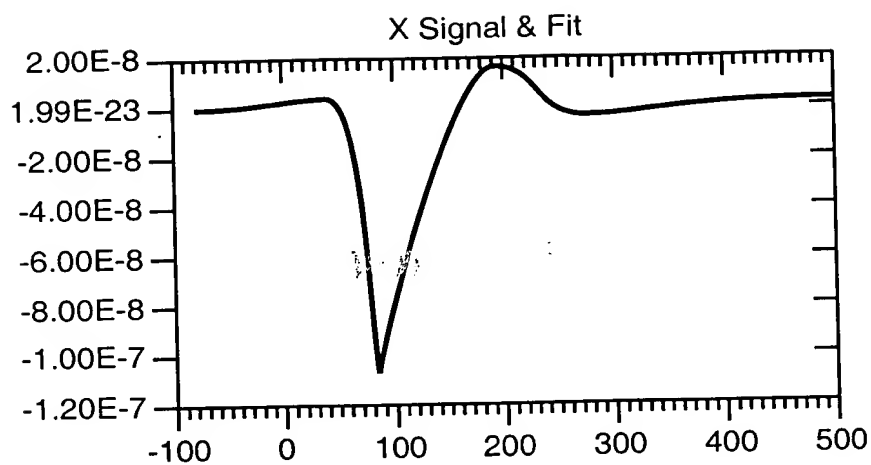
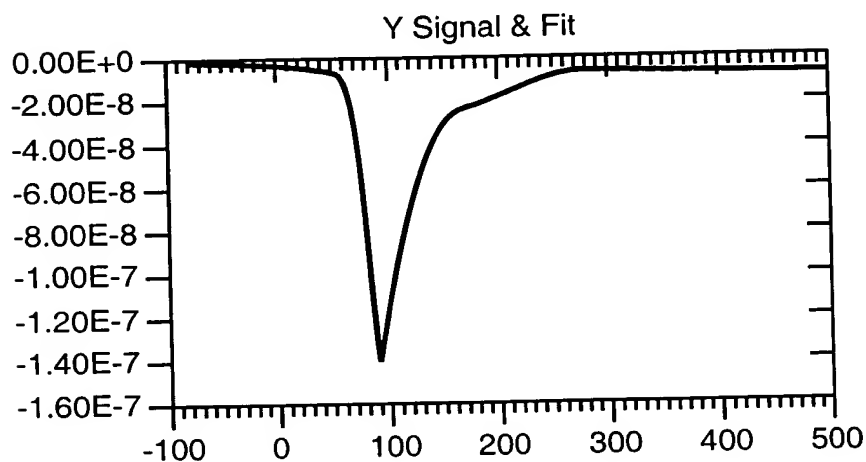


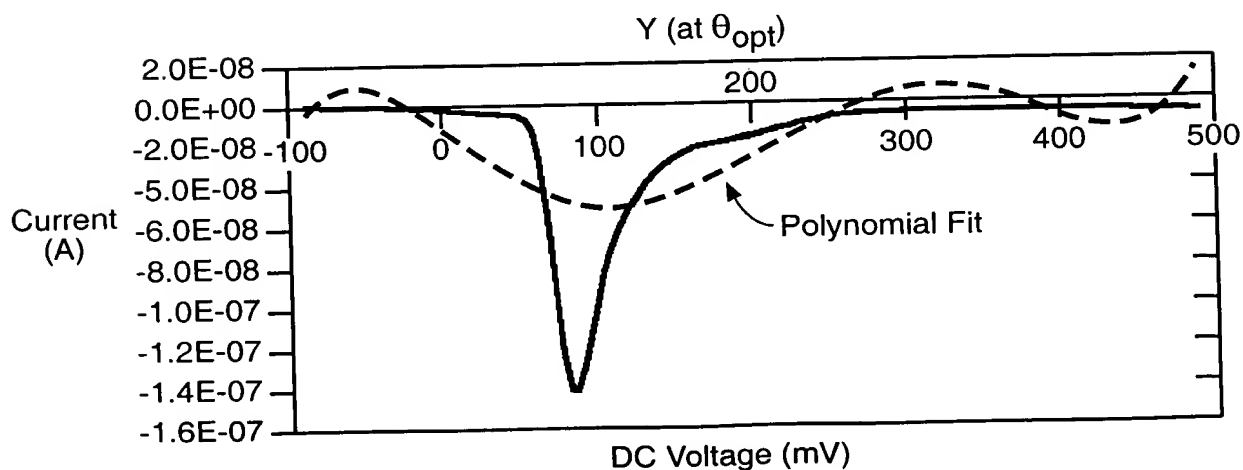
FIG. 47



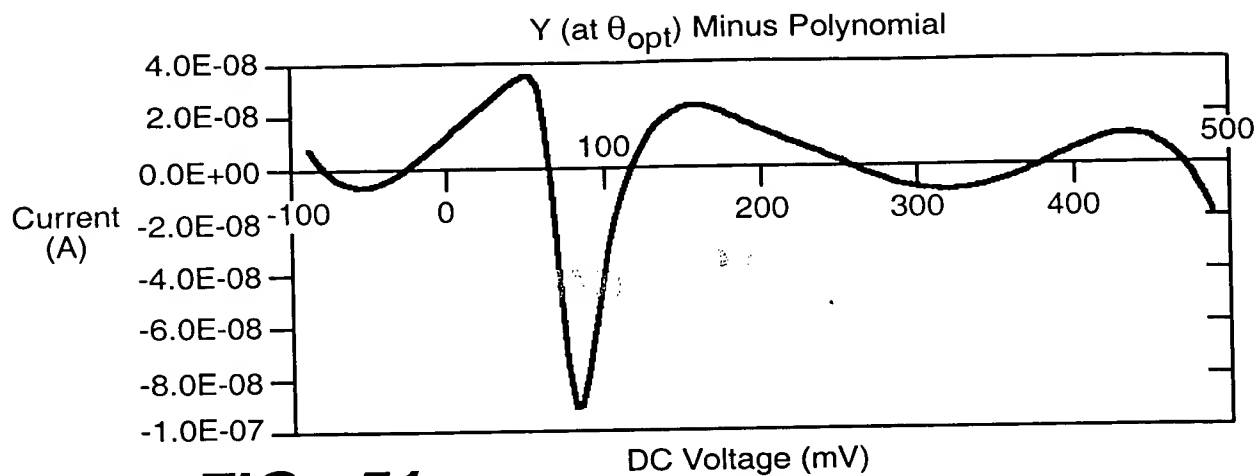
**FIG. 48**



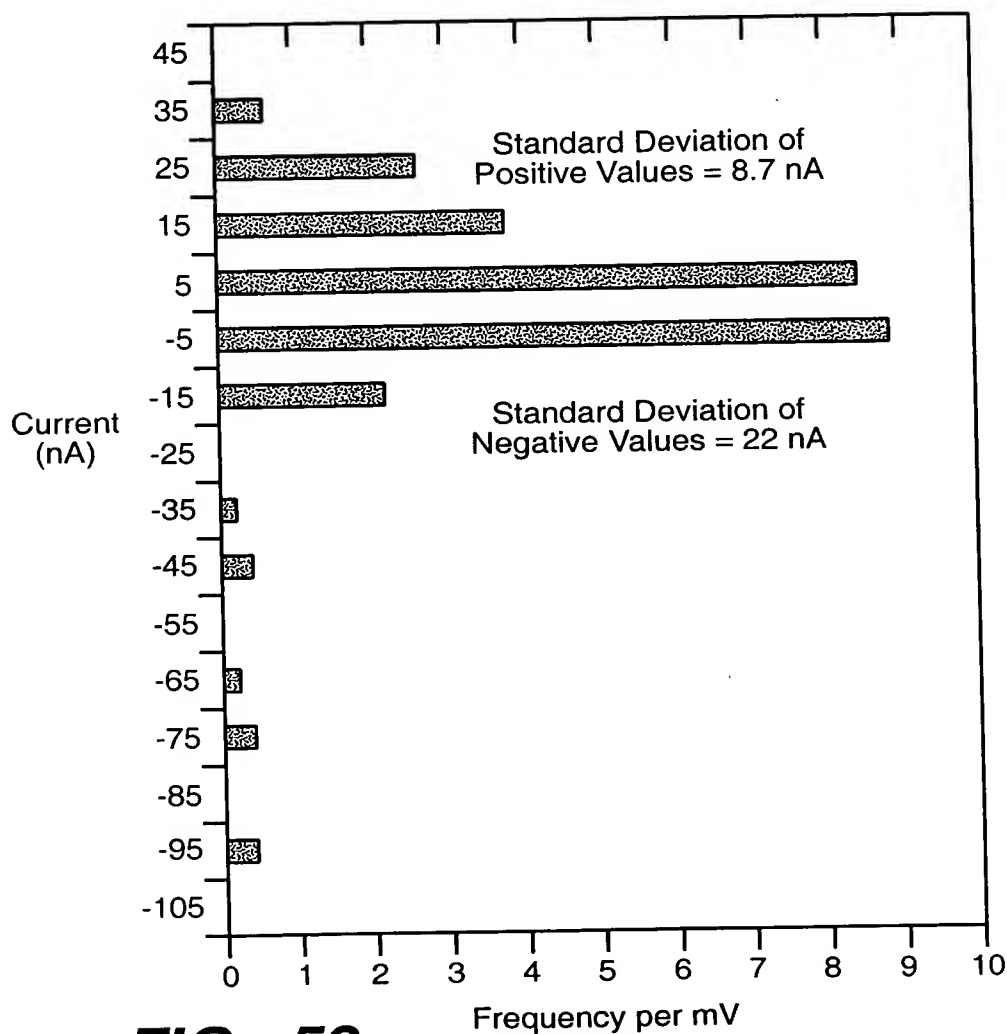
**FIG. 49**



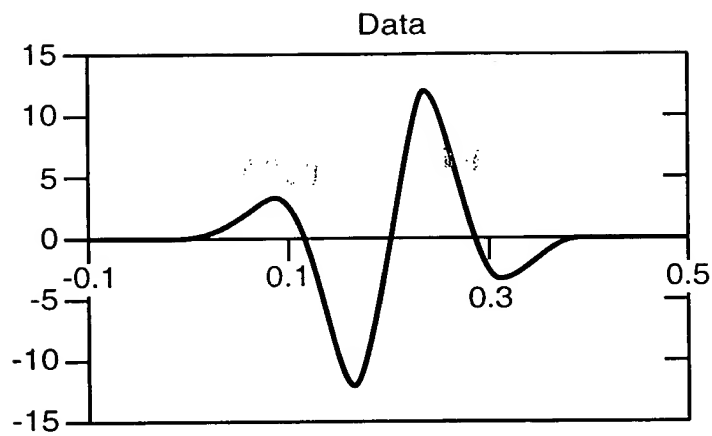
**FIG. 50**



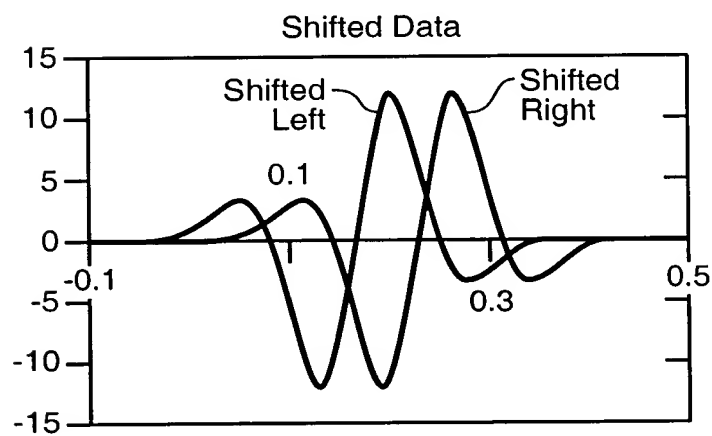
**FIG. 51**



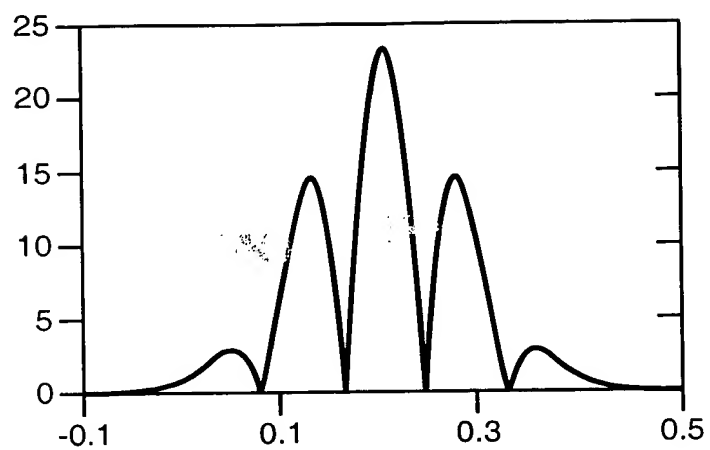
**FIG. 52**



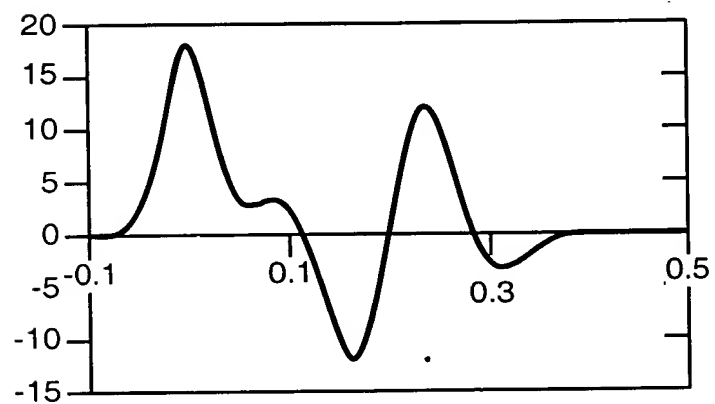
**FIG.\_53**



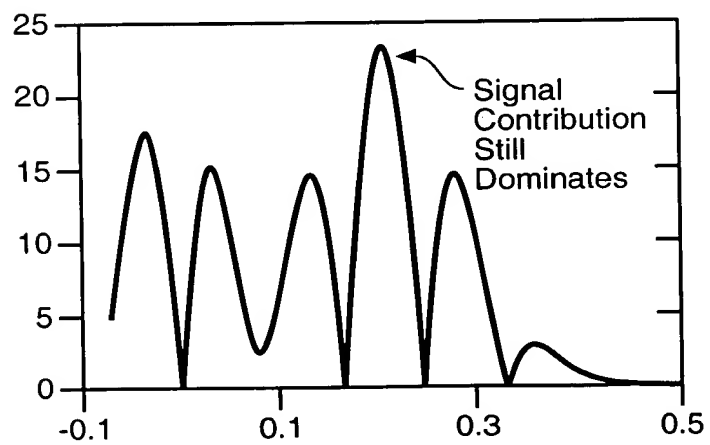
**FIG.\_54**



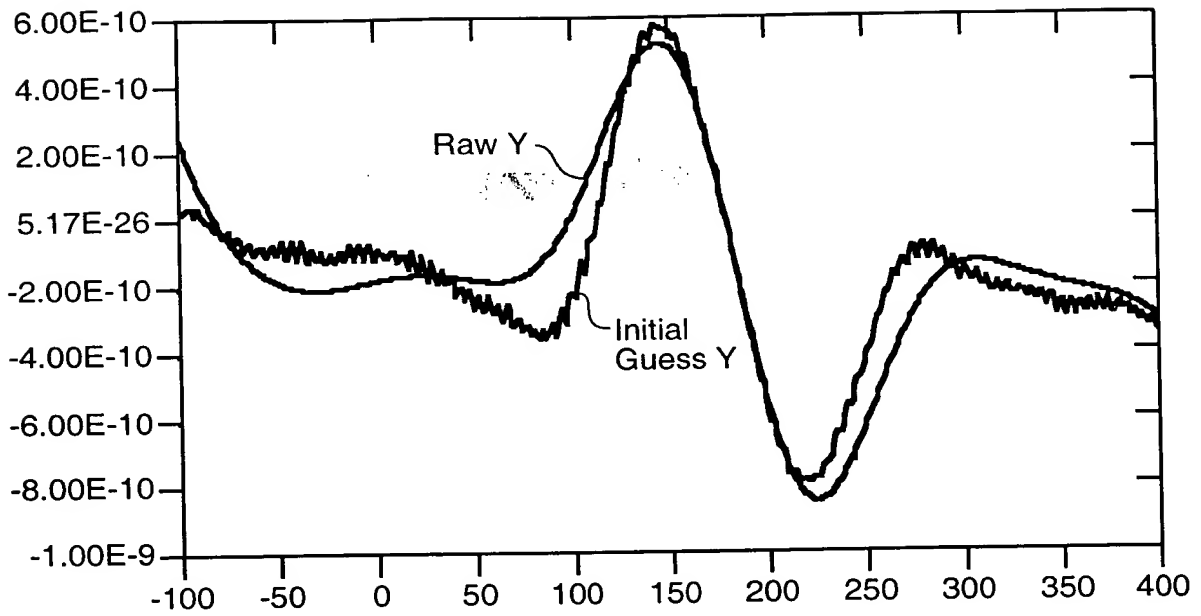
**FIG. 55**



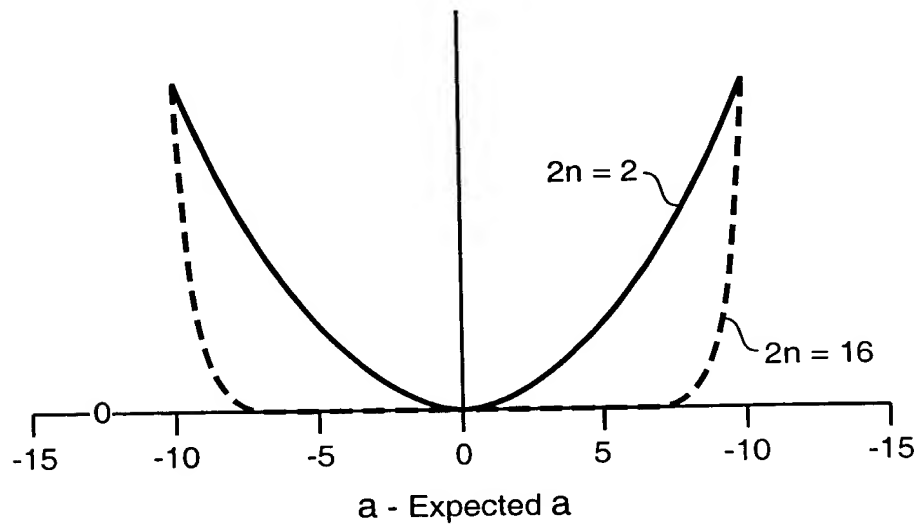
**FIG. 56**



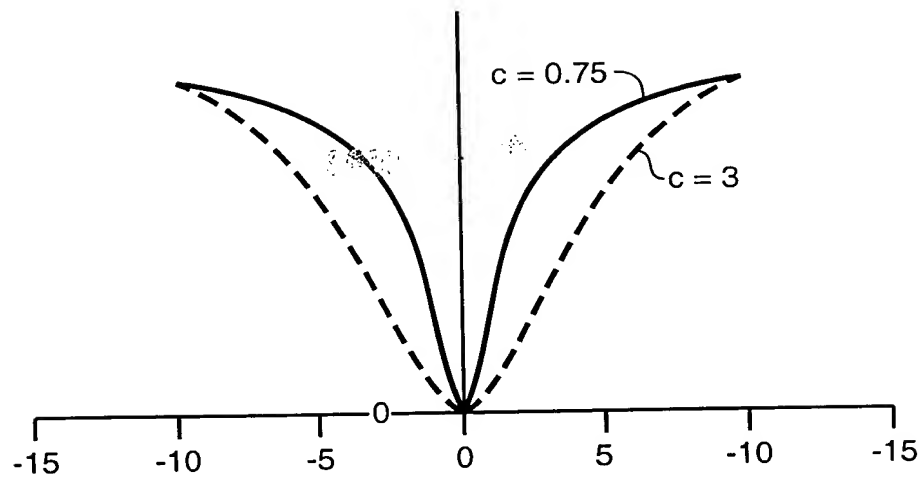
**FIG. 57**



**FIG.\_58**

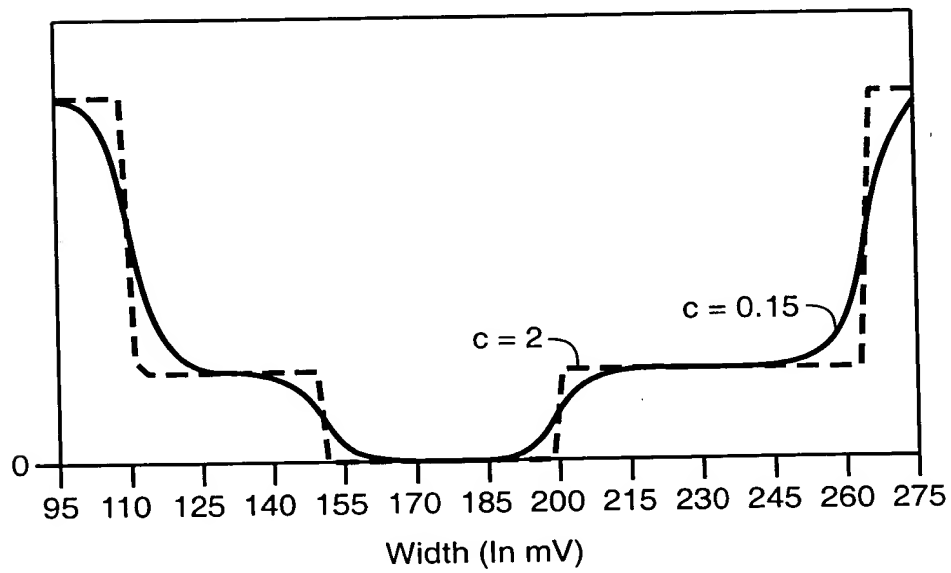


**FIG.\_59**

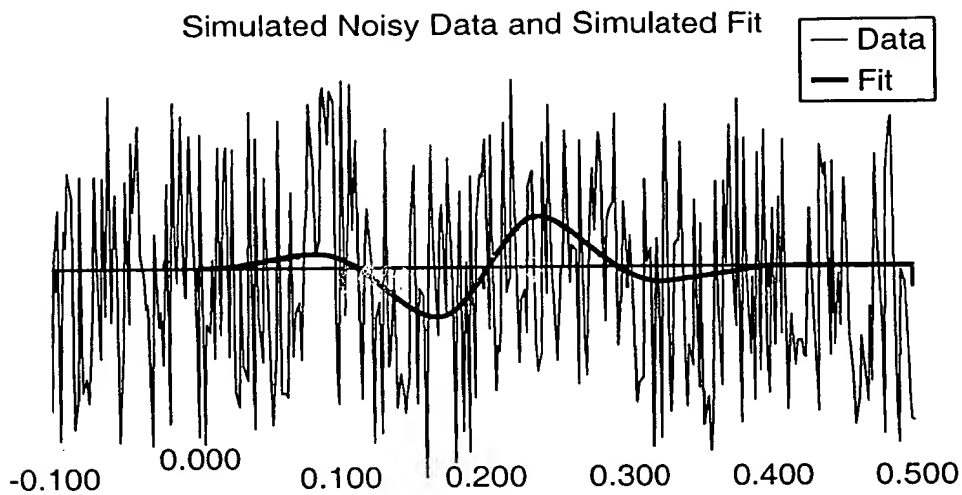


a - Expected a

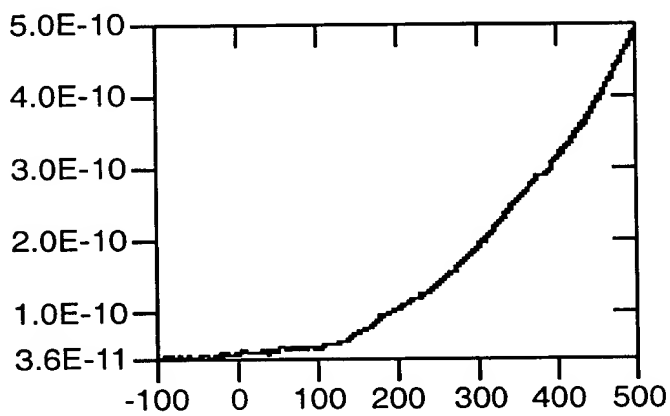
**FIG.\_60**



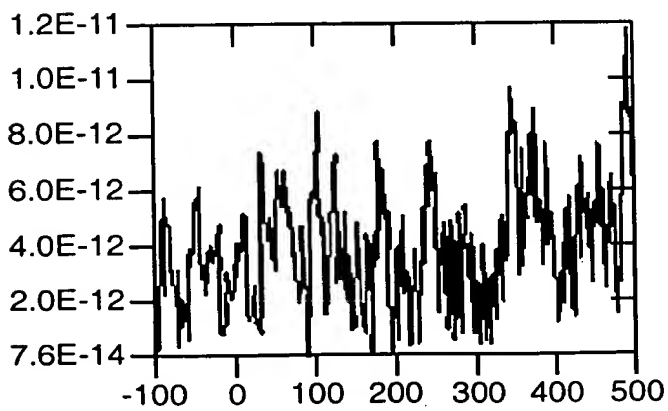
**FIG.\_61**



**FIG.\_62**



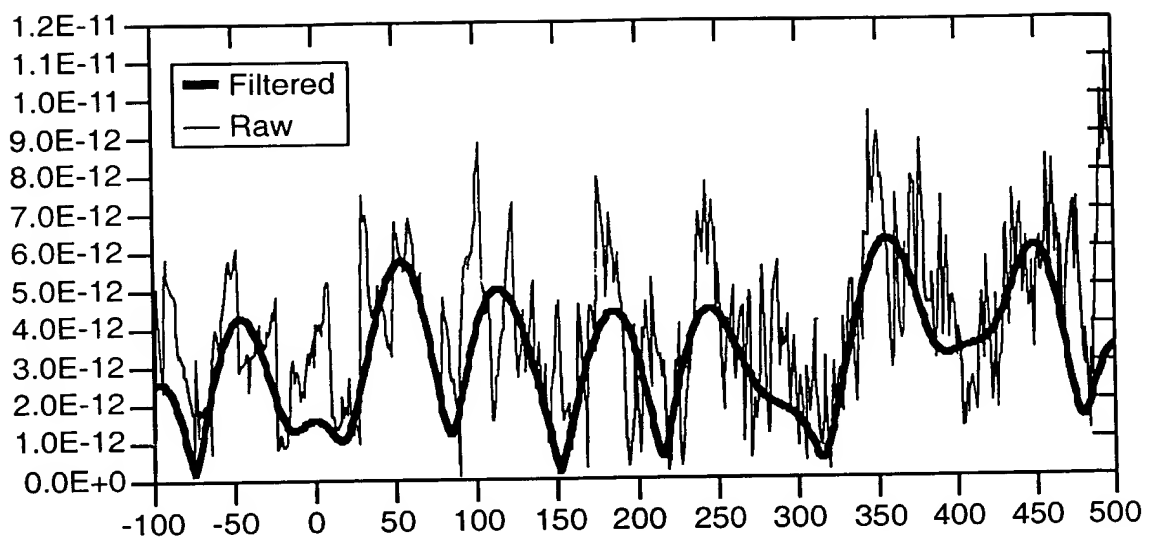
**FIG.\_63**



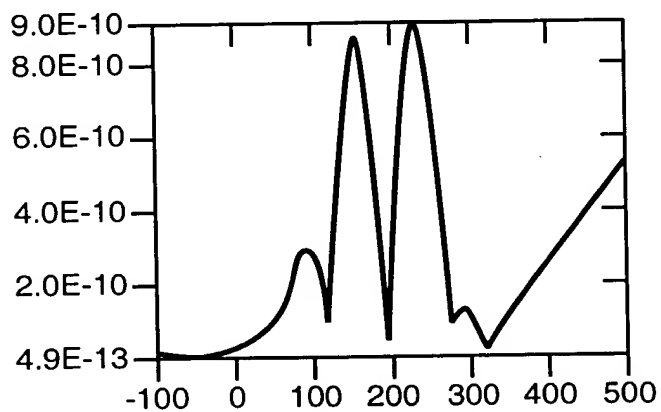
**FIG.\_64**



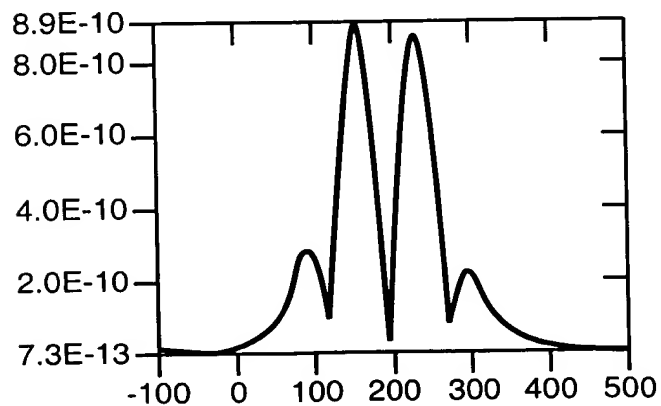
0090476 07404  
T07T20 9240660



**FIG.\_65**



**FIG.\_66**



**FIG.\_67**

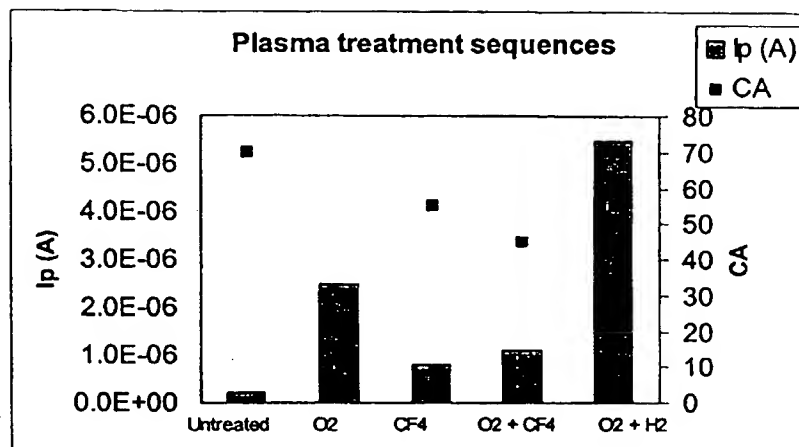


Fig. 68

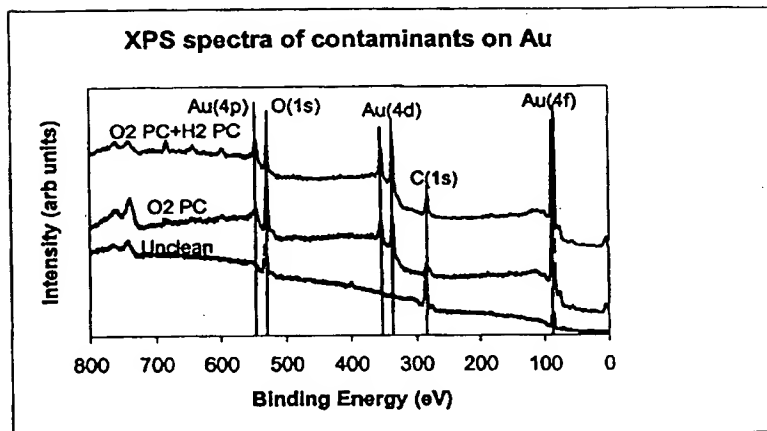


Fig 69